THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

Vol. XVIII. No. 437—21st Year.] LONDON, JULY 20, 1869. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] DOUBLE No. Price 1s.

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10,000 cubic feet of gas per ton of coal.
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13¼ cwt. coke per ton of coal.
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Patentees of the Standard Gasometers for the Government, and of the
IMPROVED DRY GAS-METERS.

These Meters are warranted to measure correctly and not to vary, and have come into general use more rapidly than any Meters hitherto manufactured.

PARIS EXHIBITION, 1867.
THE TESTING-HOUSE REPORTS.

The Reports prepared for the Science and Art Department, under the direction of the Lords of the Council, detail the arrangements made for testing the gas apparatus exhibited. In the testing-house erected by the Special Committee appointed to further this object a gasholder was constructed by Mr. G. Glover, being a *fac simile* of that produced and patented by him in 1860, and deposited in the Exchequer, under the provisions of the Sales of Gas Act, and British manufacturers of gas apparatus were invited by advertisement, and by direct application, to forward worthy objects for exhibition. Mr. G. Glover was, however, the only manufacturer who sent Meters to be tested. The report states that, as "Mr. Glover is a manufacturer of Dry Meters only, no opportunity presented itself of comparing their accuracy with that of Wet Meters under various circumstances, but the perfection to which that maker has brought his Meters prevents the possibility of those extravagant errors which are well known to exist where Wet Meters are used."
Particulars and lists of prices forwarded on application to Ranelagh Works, Ranelagh Road, Pimlico, LONDON, S.W.; 15, Market Street, MANCHESTER; or 97, Boulevard de Magenta, PARIS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE-CLAY," and they have also been awarded in the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire-Bricks, and every other article in Fire-Clay are promptly executed at their Works as above.
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JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
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ALMA WORKS,
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and 69, UPPER THAMES STREET, LONDON,
Original Manufacturers of Wrought-Iron Gas Tubes and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.
Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
N.B. All Goods thoroughly Tested before sent out, and Warranted.

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AND
STREET-LAMP
MANUFACTURERS,
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ESTABLISHED 1830.
All materials found for the alteration of Public Lamps for lighting with the Rod. Regulators with Lava Burners.

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NEAR NEWCASTLE-ON-TYNE.
WILLIAM COCHRAN CARR begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.
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These Cannels are extensively used in the Gas-Works of Edinburgh, where the illuminating power of the gas is the highest in Britain.
The yield per ton is 12,573 cubic feet; illuminating power 33·8 standard candles; coke per ton 1045 lbs.
Ports of Shipment, in the Firth of Forth.

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Ports of Shipment, either the Forth or the Clyde.
Apply to J. and W. ROMANS, 53, Frederick Street, EDINBURGH; & 1, Walbrook, Mansion House, LONDON.

NOTICE.
LESMAHAGO GAS OR CANNEL COAL.
JAMES FERGUSON & CO., Auchinheath COLLIERY, LESMAHAGO, and the NITSHILL & LESMAHAGO COAL COMPANY, AUCHINHEATH AND SOUTHFIELD COLLIERIES, LESMAHAGO, sole Proprietors and Producers of the above celebrated GAS COAL, beg to intimate to Gas Companies and other consumers that, having reason to suspect that Cannel or other Coal of very inferior quality, both as regards the quantity and illuminating power of the Gas, has frequently been mixed with and sold under the name of "Lesmahago," they have now appointed Messrs. JAMES LAWRIE & Co., of 63, Old Broad Street, LONDON, E.C., sole agents for England; and Messrs. LA COUR & WATSON, of LEITH, sole agents for foreign markets; and, in order to prevent a recurrence of the frauds named, they request that all purchasers will send their orders through the above-named firms. Orders for other than the above-named markets may be forwarded direct to either of the Proprietors.
The Proprietors will, in future, use their own forms of bills of lading, and also issue certificates of origin, signed, as the case may be, either by JAMES FERGUSON & Co., or by the NITSHILL & LESMAHAGO COAL COMPANY; and they request all consumers purchasing Lesmahago Coal to demand such a certificate for each cargo, and to observe that it corresponds with the bill of lading.
Auchinheath, Lesmahago, March, 1868.

GEORGE GLOVER & CO.,

Patentees of the Standard Gasometers for the Government,

TWO MEDALS,

LONDON, 1862.

HAVE OBTAINED THE

HIGHEST

PRIZE

FOR

SILVER MEDAL,

PARIS, 1867.

IMPROVED DRY GAS-METERS AND GASOMETERS,

AT THE

PARIS EXHIBITION.

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N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short notice.

SILVER MEDAL, PARIS EXHIBITION, 1867.

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ALBION TUBE-WORKS, BIRMINGHAM,

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For Gas, Steam, Water, &c.

SOLE LICENSEES for the United Kingdom for the LAVENANT PATENT ENAMELLED TUBES & FITTINGS,

the Coating of which does not shell off, is a certain preservative from rust, and resists all effects of expansion and contraction.

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For Locomotive, Marine, and Stationary Boilers.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools of all kinds.

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PATENTS FOR CHARGING AND DRAWING GAS-RETORTS,

WITH CHAMBERS FOR MOUTHS,

REQUIRING NO LUTING.

Gas Engineers are solicited to examine into the merits of this invention before erecting new or altering old retort-houses. It may be seen in action at the Alliance Gas Company's Works, Dublin, where its utility and economy will be clearly demonstrated. Although the saving in labour will be considerable, and quickly return any outlay of capital, there are other and important features strongly recommending its adoption at all gas-works, and which a gas engineer upon examination will at once appreciate.

The Directors of the Alliance Gas Company have kindly consented to give every facility to gentlemen desirous of seeing the invention in operation. Parties, therefore, about to visit Dublin will be so good as to send us their card, and we will furnish them with letters of introduction.

Drawings, &c., may be seen at our Office, and all details explained.

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1862.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

CLASS II.

This Paint having been in general use over seven years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

J. & J. BRADDOCK,

GAS ENGINEERS,

GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

IMPROVED CONSUMERS GAS-METERS,

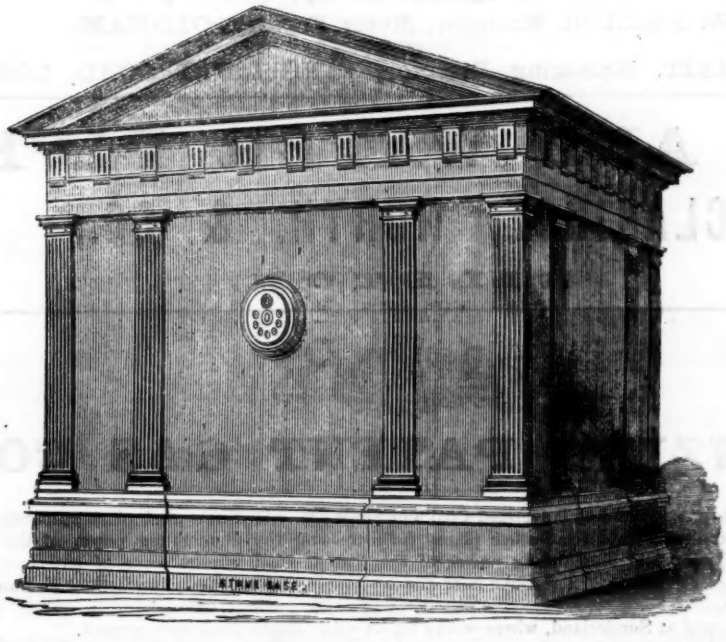
Of the Best Material and Workmanship, carefully adjusted to the requirements of the British Sales of Gas Act and Foreign Standards of Measures.

PATENT COMPENSATING GAS-METERS,

Which are uniform with the Ordinary Meters, and register with minute accuracy.

IMPROVED DRY GAS-METERS,

IN BEST TINNED IRON CASES.



GAS STATION-METERS,

ALL SIZES, WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, EXHAUST-GOVERNORS, &c.

Home and Foreign Orders promptly attended to. Terms, &c., on application.

MESSRS. J. & J. BRADDOCK,

Tender their grateful acknowledgments for the past generous and extensive patronage conferred on their firm, and beg to assure their Friends, Gas Engineers, and Gas Companies generally, that every exertion will continue to be made to maintain the sterling quality of their work in every department.

Their ORDINARY METERS, WET and DRY, have now a demand over that of any other maker in the North of England; and their STATION-METERS stand unrivalled for Design, Sound Workmanship, and Efficiency.

All sizes of CONSUMERS METERS generally in Stock.

STATION-METERS, in round or square cases, on the Shortest Notice.

GEORGE NEWTON,

(Late Senior Partner of the Globe Meter-Works,)

UNION STREET WEST, OLDHAM,

MANUFACTURER OF

IMPROVED WET & DRY CONSUMERS GAS-METERS,

GAS STATION-METERS,

With all the Joints planed,

GOVERNORS, GAUGES, INDICATORS, EXHAUST GOVERNORS, &c.

TERMS, &c., ON APPLICATION.

THE GAS-METER COMPANY

(LIMITED), LONDON,

(Successors to CROLL, RAIT, and CO., LONDON, and WEST and GREGSON, OLDHAM.)

MANUFACTURE

STATION-METERS & GOVERNORS

At their Oldham Establishment, which has long possessed the reputation of supplying this description of apparatus of the most perfect construction and appropriate design.

CONSUMERS GAS-METERS IN CAST-IRON & TINNED SHEET-IRON CASES.

STREET GOVERNORS, PRESSURE and EXHAUST REGISTERS, TEST GASHOLDERS,

AND EXPERIMENTAL GAS APPARATUS GENERALLY.

For information, &c., apply to

W. ARCHER, Manager, Meter Factory, OLDHAM;

OR TO

GEORGE RAIT, Managing Director, KINGSLAND ROAD, LONDON.

GAS AND WATER PIPES.

CLARIDGE, NORTH, & CO.,

BILSTON.

M'KENZIE'S PATENT GAS COAL.

This Patent Gas Coal is a compound of Pulverized Coal and Shale Oil. It is now used most successfully by some of the London Gas Companies, and also in Dublin and other places, for increasing the illuminating power of the Gas, which it does at less cost than Cannel Coal. The illuminating power of this Patent Coal can be made of any strength required up to 35 candles, and is in all cases guaranteed. The Coke is of the best quality, as the best Newcastle and Sunderland Coals only are used in the manufacture.

This Patent Coal is shipped at Sunderland, where works for its manufacture have been erected.

Further particulars can be obtained from

W. W. JOBSON, 16, Fish Street Hill, LONDON; or

WALKER, BRUCE, & CO., Patent Gas-Coal Works, South Docks, SUNDERLAND.

EXTRACT *from the Inaugural Address of* THOMAS G. BARLOW, Esq., C.E., *President of the British Association of Gas Managers, at their Fifth Annual General Meeting, held in London on the 2nd of June,* 1868.

Gentlemen,—In considering the progress that has been made in the manufacture and distribution of Gas during the past year, the new inventions and new processes which have been adopted or tried with prospect of success, deserve to be specially noticed. Foremost among them is M'Kenzie's process for producing Gas of high illuminating power from small Coal, mixed with crude Shale Oil. The pressure which the Legislature has recently put on Gas Companies to raise the standard of illuminating power considerably above that obtainable from common Coal, has compelled most of them to use a certain proportion of Cannel Coal, at a heavy loss, and with a diminution in the value of the Coke. The advance in the price of Cannel Coal, consequent on the increased consumption, has stimulated inquiry to find a substitute for it; and this seems to have been accomplished by Mr. M'Kenzie, whose process has been successfully adopted on a large scale at the Alliance Gas-Works in Dublin. The small Coal is well mixed with the Oil, in the proportions varying from 10 to 30 gallons of Oil to one ton of Coals. This is effected by means of a mixing or grinding mill. The Compound material is then distilled in ordinary Gas Retorts of clay or iron, at a strong heat. I have recently witnessed an experiment on a mixture of Llantwit Small Coal shipped at Cardiff, and costing in Dublin 12s. 6d. per ton, with 5 per cent. of Broxburne Shale Oil, costing £5 10s. per ton, the produce of the distillation of one ton of which mixture was—

9750 cubic feet of Gas, 21·5 Candles illuminating power.
37 bushels of good hard, saleable Coke.
2 bushels of Breeze.
11 gallons of Tar.
15 gallons of Ammoniacal Liquor, of 5° Twaddle.

The cost of this mixture, including Royalty, was about 17s. per ton, against 24s. for Wigan Cannel, over which it has the advantage of at least 5s. per ton in the value of the Coke.

FOR SALE,

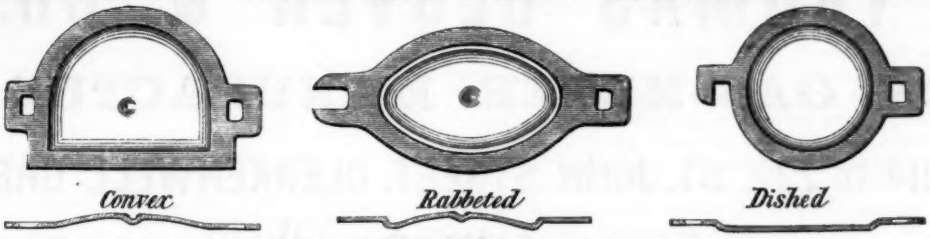
SEVERAL SECOND-HAND STATION-METERS & GOVERNORS,

All in excellent Working Order, equal to New, guaranteed.

APPLY FOR FURTHER PARTICULARS TO

GEORGE RAIT, Managing Director, GAS-METER COMPANY,
238, KINGSLAND ROAD, LONDON, N.E.;
OR TO
WILLIAM ARCHER, THE OLDHAM METER MANUFACTORY, OLDHAM.

PIGGOTT'S IMPROVED RETORT-LIDS.



Convex *Rabbeted* *Dished*

The Manufacturers desire respectfully to call the attention of Gas Companies and Engineers to their Improved Retort and other Stamped Wrought-Iron Lids, which possess the following advantages over Wrought Lids hitherto manufactured:—Uniform size and shape, a smooth and even surface, and a superiority of finish hitherto unattained. These desirable qualifications are preserved *irrespective of form*.

The Manufacturers have recently laid down extensive Hydraulic Machinery, with a view to acquire the above result, and the success they have achieved in this branch of their business has surpassed their most sanguine expectations. The simple fact that these Lids fit into one die, and are stamped and cut out at one blow, is a sufficient proof that they must be necessarily alike in all respects, and superior to any other make.

The following Gas Companies have the Lids in use, and can certify to their merits:—

Belfast,	Burslem & Tunstall,	Fazeley,	Luton,	Stoke Fenton and Longton,
Beverley,	Bury,	Gloucester,	Nottingham,	South Shields,
Birkenhead,	Carlisle,	Harrogate,	Nuneaton,	Southampton,
Birmingham and Staffordshire,	City of London,	Huyton and Roby,	Perth,	Stockton,
Bombay,	Cowes,	Leeds,	Preston,	Tunbridge Wells,
Bradford,	Croydon,	Leicester,	Portsea Island,	Victoria Docks,
Brighton,	Crystal Palace,	Liverpool,	Rossendale,	Warrington,
Brighton and Hove,	Derby,	Longport,	South Metropolitan,	&c., &c.
	Equitable, London,	Lowestoft,	London,	

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THOMAS PIGGOTT & SON,

ENGINEERS, CONTRACTORS, and IRONFOUNDERS,
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PATENT IMPROVED
CAST-IRON CASED DRY GAS-METER

(*Drawings on application*).

FULLERTON, SON, & CO., ABBEY MOUNT WORKS, EDINBURGH.

Station-Meters and Gas Apparatus, Consumers Wet Gas-Meters in Cast-Iron, and Dry in Tin Plate Cases.

DRY GAS-METERS IN CAST-IRON CASES,

MANUFACTURED BY

WILLIAM AND BENJAMIN COWAN,

(ESTABLISHED 1827,)

BUCCLEUCH STREET WORKS, EDINBURGH,

Possess a simplicity of construction and facility for repair greater than any yet produced, while the excellence of the material and workmanship, and accuracy of registration, cannot be surpassed. The superiority of their Dry Meters in Tin Cases is also well known.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS.
COWAN'S PATENT SIDE-VALVE GAS-METERS.

THE

UNIVERSAL EXHIBITION OF PARIS,

1867.

SILVER MEDAL.

THOMAS CLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON,

HAVE BEEN AWARDED THE HIGHEST PRIZE FOR

DRY GAS-METERS,

BY THE IMPERIAL COMMISSIONERS FOR THE

UNIVERSAL EXHIBITION, 1867.

WILLIAM PARKINSON AND CO.

(SUCCESSORS TO SAMUEL CROSLEY),

PATENT WET AND DRY GAS-METER MANUFACTURERS, &c.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

PATENT IMPROVED WET METER.

W. P. and Co. invite especial attention to this Meter, which entirely overcomes the difficulty to which ordinary Wet Meters are subjected, owing to the short range of the Float, which is necessary, in order to meet the requirements of the Sale of Gas Act.

"It is well known that n Meters constructed so that the valve will close when the water is drawn off to such a point as to render them 3 per cent. slow the lights are liable to be extinguished by the closing of the valve by a sudden increase of pressure. To meet this difficulty, Mr. Pinchbeck has invented an ingenious and simple arrangement by which the action is reversed, and any such increase of pressure, in his Meter, raises the value instead of depressing it. The fact of the improvement having been adopted by Messrs. W. Parkinson and Co. is a sufficient guarantee that it practically and effectually remedies the inconvenience it is designed to meet."—JOURNAL OF GAS LIGHTING.

PATENT IMPROVED DRY METER,

Which W. P. and Co. pledge themselves to manufacture with the same quality of materials and workmanship as in their Wet Meter, thereby giving Gas Companies and others the advantage of procuring a first-rate Dry as well as a Wet Meter, which, hitherto, they have been unable to do.

STATION-METERS AND GOVERNORS.

Which can be seen at all the London Gas-Works. Also Liverpool, Manchester, Sheffield, Nottingham, Belfast, Glasgow, Birmingham, Dublin, Bristol, Leeds, Leicester, Brighton, Southampton, Sunderland, Wolverhampton, Bradford, Norwich, &c., &c.

TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription to the JOURNAL is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders should be made payable at the Money-Order Office, London, to William B. King, 11, Bolt Court, Fleet Street, by whom the business department of the JOURNAL is conducted.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JULY 20, 1869.

Notes upon Passing Events.

THE House of Commons, during the discussion on "Supply," has been ventilating two or three subjects, of which we shall hear further when the big questions that now agitate the public mind have been disposed of. For instance, there was the vote of over £400,000 for stationery and printing, about which a good deal might be said; and something was said, but not exactly in a useful direction, because none of the parties who spoke had any practical knowledge of an essentially practical question. The carping at the salary of the person who superintends the binding department was a sheer waste of time. If the officer in question does his duty, he must have plenty to do. The root of the extravagance in this department lies in the recklessness with which returns, reports, and evidence are ordered, and printed at vast expense, without possessing any interest worthy of publication. Before a return is ordered to be printed, unless some urgent reason can be given, a responsible officer of the House ought to know the cost. Thousands of papers are printed which would be just as useful in manuscript. Then, again, the evidence attached to reports is continually swelled by unnecessary appendices. A witness will not only cause to be printed a pamphlet that no one would read without a fee, but he will even reprint a pamphlet with tables no one ever reads. The case of a gentleman now unpleasantly notorious—Mr. Grenville Murray—affords a flagrant instance of the abuse of the Blue-Book system. Mr. Murray was dismissed for neglecting his duties, and all the really important evidence on the subject could have been contained in sixteen folio pages, but, for some occult reason, an enormous volume has been compiled, including all that anybody of any character or no character had to say about Mr. Murray. The nation pays several hundred pounds for the minute details of a case that, if in a court of law, the *Times* would have summed up in a few paragraphs. No one but a friend or an enemy of Mr. Murray's could read this stuff; but it suits some one, and above all the printers, to heap "pig upon pork." It is well known that Blue-Books, sold for waste paper, form one of the valuable perquisites of the servant of a Member of Parliament. There is a Printing Committee, but no unpaid body will go through the labour of sifting the wheat of MSS. from the chaff. The system of printing by contract is altogether delusive as a means for securing economy. One of the parliamentary printers, under the patronage of the late Mr. M'Culloch, was in the habit of tendering at so much below cost price that no respectable firm could compete with him. He relied safely on extras and corrections to recoup him for certain deficiency on the small amount of work which came within the contract. If a Member of Parliament who had been a printer and publisher were to take up the question, he would be able to show that, by employing competent men at adequate salaries to superintend the work, an economy amounting to many thousands a year could be effected, but then honest men must be employed and trusted. Still wasteful extravagance in the publishing department will prevail, until some check is put on the facility with which M.P.'s make political capital by moving for returns, and for the evidence of committees. We should suggest that the Publishing Committee issued a report at the close of every session, giving the nature and cost of each return, and the name of the member who had obtained it.

The expenses of the office of Woods, Forests, and Land Revenues led to a debate which looks like the beginning of the reform of one of the grossest abuses and grossest jobs of our system of government. Mr. Alderman Lawrence opened the ball with a protest against paying two gatekeepers to exclude all the public, except those who rode in carriages, from the Palace Gardens Road. "If the occupants insisted "on keeping this road private, the least they could do was to "pay the gatekeepers." Mr. Locke was greeted with loudly supporting cheers when he said that the "Woods and Forests "was a department not entitled to the slightest consideration "from that House. It was a department which was leagued "against the British public, and which endeavoured to do "them all the harm it possibly could." He mentioned the case of Blackheath, where, for the sake of getting fifty pounds a year for gravel, they had allowed the heath to be disfigured with dangerous pits. Mr. Gore, before the Select Committee on Open Spaces, appears to have candidly avowed the principles of stupid tyranny on which he consistently acts. He cares neither for the British public at large "nor the British "public in particular;" he has only one object—to extract as much money as possible from the lands under his charge, at any sacrifice of what is useful or what is beautiful. Mr. Gore's Board vehemently opposed the Metropolitan Board of Works in the Thames Embankment, equally vehemently supported the extravagant claims of the Crown tenants in Hamilton Place to compensation when an improvement of the Park Lane exit was proposed. Every promoter of a new street, or dock, or railway, or a reclamation of waste shore, who comes in contact with this permanent irresponsible Board, finds it equally grasping and litigious in enforcing its claims, and ignorantly profuse in expending its funds. The Board sometimes reclaims forest land, as at Epping and in Oxfordshire, and then

we see a preposterous expenditure in works and buildings, for the benefit of the tradesmen it favours. The whole theory is an anachronism in the present day. The reigning sovereign surrenders, on accession to the throne, its hereditary domains, in return for a Civil List which is always voted and always will be voted as long as the monarchical system exists. The Crown property is given up to the management of a permanent Board—the commissioners being the Hon. Charles A. Gore and the Hon. James K. Howard, with salaries of £1200 each; two principal clerks; a receiver-general; and, for England, a solicitor, with £1800 a year. The Board, which is not represented in Parliament, sells, buys, builds, invests, and reinvests at its will and pleasure, exactly on the plan of the trustees of a private estate. It holds lands and farms all over England, and exercises splendid patronage in management. When you deal with them you deal with perfect Shylocks; when you fight with them you fight with the Crown. The theory is essentially vicious. The whole rent-producing property ought to be realized, and invested in Government or other simple securities; thus would be removed a mischievous obstructive machinery. The property administered for public uses should come under parliamentary control, through a responsible minister. We trust that some of our younger members of Parliament will move next session for a committee to inquire into the manner in which the duties of the Board of Woods, Forests, and Land Revenues are performed. Engineers, architects, and Local Boards can give some telling evidence.

The strong-minded female—one of the nuisances of the present generation—has been making her appearance in Parliament, and pulling vigorously at the gratings which now hide female visitors from the sight of M.P.'s speaking, sleeping, and snoring. As a matter of public policy, there is no reason why women or any men, except reporters and young gentlemen in training for public life, should be admitted to hear the debates in the House of Commons. The strangers galleries, both male and female, are mere places of amusement, like the benches in the Probate and Divorce Court. As it is settled that ladies are to be admitted, there is every reason why their private box should be clean, airy, and comfortable, with roomy chairs duly numbered to prevent the disputes to which the female mind is so prone, after the manner of stalls at the opera; a neat retiring-room should also be provided, with an ample display of mirrors, brushes, combs, and powder. It would not be amiss if, on crowded nights, the refreshment contractor afforded the afternoon tea and the refreshing ice. But if the ladies gallery is to be opened to those who read the debates in the daily papers, and take an interest in them, and not to the overflowing irrepressible females who are always looking for a new place in which to display a new costume, it is to be hoped that such a grating will be kept up as will allow the dear creatures to see and hear everything without being able to display their rival real and artificial charms. Pretty dresses are very proper things in their places—at balls, dinner parties, operas, morning concerts, and drives in the Park or to races; but the gallery of the House of Commons should be open to the wives and daughters of budding M.P.'s, to country cousins, and to all the respectable and zealous tribe of hard readers, to many of whom a low dress is a difficulty, if too often repeated, and a dress hat or bonnet a serious affair. This grating business is one small sign of the general tendency of a certain sort of women to assert, on all sorts of occasions, "We are as good as men." So they are, and a great deal better, but no more fit to do all men do mentally than physically. In these modern times all the libraries, all the learning of the world, are open to women, but no extraordinary exception has arisen like those familiar instances of men who have risen to the highest intellectual positions in spite of every difficulty. The advocates of the rights of women—we do not mean the rights of property, to which they are justly entitled—generally end by getting married, and not unfrequently follow up their course by being divorced. We hear that the grating is so vehemently opposed because its removal is supposed to be one step towards a seat in the House of Commons for the fairer and nobler sex.

A case tried a few weeks back illustrated so strongly the absurdity of the law of compensation as applied to public companies, that it only needs one or two more to create a public opinion in favour of modifying Lord Campbell's Act. A Miss Warren, a teacher of dancing, was at a railway station where, by unusual luxury, the waiting-room was carpeted. It was worn, and there was a hole in it; she caught her toe in this hole, fell, and was seriously injured. If this had happened in her attorney's office, as it might have done, no more would have been heard of the case. Fortunately for herself, she consulted or was advised by a solicitor of preternatural acuteness to bring an action, and recovered £1500 damages—not a farthing too much for the injuries she received, but it is only from a great company that any damages could have been recovered for what was so purely an accident. In this instance the sympathy was naturally with the poor young woman; but, if the principle was right, the same rule should apply in cases where the stumbler is a fat, middle-aged gentleman. Let us suppose, for instance, that the vicar of a tolerable living has occasion to ask the advice of his bishop, on a tour, as to the ritualistic proclivities of a young curate fresh from Oxford. The bishop, only recently installed, and full of kindly zeal, proposes to combine a little luncheon with some friendly advice. The bishop, entering the room devoted to study and fishing-rods, stumbles over a hole in the well-preserved Turkey, falls prone and with full force against the stone chimney-piece. He lingers, but finally gives up the ghost. The representatives of the bishop bring their action against the careless vicar—the sons who expected good livings for themselves, the daughters for their husbands. The damages, calculated on the principle and scale of those awarded to the unfortunate dancing mistress, could not be a penny under ten thousand pounds; but the odds are that, although the bishop's family might be beggared, they would not recover ten pence if they had the courage to bring an action. The case of a railway collision is quite different. There the safety of the public, the provision of sound permanent way, efficient engines, and a sufficient staff of signalmen, are ensured by the liability of companies for injuries for which juries think they are responsible. Whether railway passengers ought not to be compelled to insure at a certain rate is another question not yet seriously discussed. The unfair manner in which railway companies are considered by a certain section of the public was also illustrated the other day in an article on "The En- "croachments of Railway Companies upon Public Rights," which appeared in a weekly paper supposed to be the peculiar representative of parochial interests. The encroachments especially alluded to are those of the three great companies, the London and North-Western, the Midland, and the Great Northern, which have absorbed important portions of St. Pancras parish, and made access from Euston Road and Islington to Camden Town circuitous. This is quite true. No doubt some railway bridges and roads are needed; but, when it is considered that the railways in question produce an enormous income to the parishes crossed, in rates collected without the smallest trouble—that they have removed very troublesome cottage property, and raised by from 10 to 20 per cent. the value of the district crossed, this parochial howl about encroachments is very unjust, although it may be popular.

The Government continue to add to the vast pile of good intentions they have already accumulated in the shape of Bills to be brought in next or at some future session. On Wednesday, Mr. Bruce—a very Hercules if he succeeds—promised to undertake a measure for regulating trades unions, after a debate which was not without its uses. There are at least three sets of opinions at work on this question. There are the representatives of the master of the old school, when men asked for work as a favour, and mechanics accepted and wore second-hand clothes. These think that all combination by men should be made illegal, and trades unions committees routed out with the constable's staff, if not the bayonet's point. They say little—the temper of the times is against them, and they are obliged to be content with almost silent yet steady opposition to the claims made by the associated trades. Then on the opposite side are the modern philosophers who have taken for the idol of their worship—for their ideal of political perfection—the working man of the trades union. The philosophers of the last century took their representatives of ideal perfection sometimes from Brahmins, sometimes from Chinese, sometimes, and more often, from the noble savage. Now our new lights of Oxford think that the only person in this political world who should be allowed to do exactly as he likes is the mechanic member of a trades union. The third set of opinions are held by employers of labour, who desire that every man should have as much liberty to combine and to strike as does not involve tyrannizing over those who are not inclined to do either the one or the other. We need not dwell on the

speech of Mr. T. Hughes, who has no practical experience of working men except what he picked up in Lambeth, and who belongs to the romantic school of politicians. Mr. Brassey, Jun., speaking as a Liberal, and also as the son of one of the greatest employers of labour, observed:

No law, however severe, had succeeded in putting a stop to trade combinations, even in the despotic states of the Continent. . . . The principles on which legislation should proceed were, it appeared to him, tolerably clear. The Legislature could not very well, in the first place, refuse to the operative classes the right to combine for the purpose of endeavouring to regulate the terms of their labour, while every possible protection which the law could afford would, he hoped, be furnished against coercion, so that all those operatives who wished to keep aloof from such combinations might be enabled to do so if they pleased.

Mr. Brassey did not believe in the cheapness of work done at low wages, and he thought that the rise in the rate of wages which has taken place within the last ten years is due to many causes, but not to the combinations of trades unions. We believe that statistical facts would bear out this opinion, for whenever trade is slack, there is no difficulty in getting work done below the union tariffs. The highest class of skilled labourers—the mechanical engineers—have not had their wages raised during the last fifteen years, perhaps because the demand for railway work was greater fifteen years ago than at present. M. Schneider's operations at Creusot have been quoted to show the decline of our manufacturing powers on this point. Mr. Brassey observed:

It was repeatedly stated that the competition with foreigners was producing a disastrous effect on British industry, and he did not mean to deny that the foreign manufacturer was approaching us day by day, and that he stood more upon a level with the English manufacturer than formerly; but the consequence of any artificial increase in the rate of wages at home would be that we should be beaten by the foreigner in neutral markets, and that capital, no longer obtaining an average rate of profit here, would seek for foreign investment. Should that occur, he should like to see what the trades unions, with all their assumed power, could do for the operative classes. As yet, however, it was not true that we were not able to compete with the foreign manufacturer. In an article which appeared in the *Edinburgh Review*, a short time since, it was stated that M. Schneider had manufactured an engine for the Great Eastern Railway, while the construction of another locomotive had been entrusted to the Messrs. Kiechler, of Esslingen. It was added by the writer of the article to which he referred that the construction of those two engines incontestably proved that engines could be constructed abroad as good as in this country, and at a cheaper rate. Now, the real state of the case, he believed, was, that in 1865, 15 engines had been ordered from M. Schneider, while 40 had been ordered from English firms, the object of the engineer who ordered the 15 being to keep down prices in England, perhaps, as much as anything else. Twenty-five engines more were afterwards ordered from M. Schneider, but he had not, it was thought, found the execution of his contract for the first order very profitable, and availing himself of the financial embarrassments—it was supposed somewhat gladly—of the Great Eastern Company, the 25 engines were never made. In the case of the East Indian Railway, another order was given in 1865. Mr. Meadows Rendell ordered 80 engines from an English firm, and 20 from the Messrs. Kiechler, of Esslingen. Subsequently he ordered 20 more, 10 from an English and 10 from a foreign house. In that case the foreign was paid the same price as the English manufacturer, but at the conclusion of the contract great complaints were made by the foreign firm of the loss they had sustained, and they asked for a further order for engines, at an increased price, to compensate them for that loss. In the present year an order for 40 engines was given for a Hungarian line, and, the tenders being open to the public, 35 of the orders were given to the English, and only five to foreign firms. He thought, therefore, the House, looking at these facts and the general state of trade, as shown by statistical returns, had no reason to infer that foreign competition was able to drive us out of neutral markets, in consequence of the higher rate of wages which we had to pay. He drew from what he had just stated the inference that, if trades unions should succeed in raising the cost of production beyond that which it was abroad, they would immediately produce the most disastrous consequences, so far as the interests of those whom they represented were concerned, while he denied their power to raise the rate of wages beyond a point which would not leave a fair rate of interest for the capital employed. While supporting the Bill, however, there should be some law to prevent intimidation, and he believed that the India penal code contained provisions on the subject of threats which would fully meet the case. Then, if Parliament recognized the right of workmen to combine, it should protect the funds of their trade societies from embezzlement, so long as these societies conformed to the law. Besides this bare protection, privileges might be given to trades unions which conformed to certain reasonable regulations. The Royal Commissioners prescribed four conditions, but he was not sure that all of these could be reasonably enforced. It would scarcely be consistent with public policy to give more than a bare protection to its funds in the case of a society which did not accept the use of machinery. But others, which had no such rules in restraint of trade, might receive the privileges conferred by the Friendly Societies Act, and might have power to buy an acre of land, and build a trade hall for the purposes of their meetings.

Mr. Platt, an advanced Liberal and a machine manufacturer, said:

The House must remember that trades unions comprised a small minority of the working classes of this country, and the interests of the majority must not be lost sight of. Any union with rules which operated in restraint of trade robbed the non-unionists of the employment which was their due. Again, it should be remembered that a few strikes were caused by a question of wages only. For instance, the strike of the engineers in 1852, which originated in his own workshops, had for its object—first, to limit the number of apprentices; and, secondly, to provide that if machinery were introduced it should be worked by a skilled hand, even though an agricultural labourer might learn the use of it and work it in 24 hours. These were the causes of the strike which ended so disastrously for the engineers; but since then the society had been managed more prudently, and from Mr. Allen's evidence before the Royal Commission, it seemed that these two rules had been expunged. Two principles were now contending for the mastery—one the trade union, the other the co-operative system, in which there was nothing antagonistic to labour or freedom of trade. He thought the time was not far distant when these two systems would come into opposition, and in his opinion co-operation would then beat trades unions. He willingly voted for the second reading of the Bill. *At the same time there must be some clause to protect non-unionists who were willing to work at lower wages, or on other conditions, but who were at present subjected to coercion by picketing and various kinds of threats.*

Mr. E. Potter, a cotton manufacturer, and a very advanced Liberal, was evidently opposed to the Bill. He relies on education—compulsory education—to counterbalance trades unions:

To show the influence which unionists could bring to bear even upon a large town such as Manchester, he might allude to the bricklaying trade. The consumption of bricks in Manchester was about 70 million a year, and the wages paid amounted to about £35,000; but—would the House believe it?—the city of Manchester could not get a single machine-made brick. No brickmaker dared introduce such a thing into the town. Machine-made bricks might be produced at a reduction of one-third in price, while their quality was 50 per cent. better; so that Manchester would have been a gainer by paying the hand brickmakers their wages, and letting them go about like gentlemen. So long as they allowed one-fifth of the population to remain in intense ignorance, and consequent poverty, they could not avoid such a state of things. The leaders of the unionists were men of talent, but their followers were very ignorant. The Government must, therefore, not only legislate next year for trades unions, they must bring in a strong education measure, for it was only by a very strong compulsory education Bill—he did not care how strong—that they could hope to make any impression on trades unions.

Mr. Mundella, a Nottingham lace manufacturer, and returned by the working men of Sheffield, supported the Bill up to a certain point, and advocated Boards of Conciliation as the remedy for strikes. His opinion must have great weight:

The Royal Commissioners stated that they had examined the evidence brought before them on the subject of arbitration, and had come to the conclusion that the establishment of Boards of Conciliation offered a remedy against strikes at once speedy, safe, and simple. He (Mr. Mundella) and others had tried it, and the right honourable gentleman in the chair, who knew the district, said that whereas fifteen years since it was the most turbulent district in England, it was now the most peaceful. He had received that morning a letter from the honourable member for Durham (Mr. Henderson), who was largely concerned in the carpet trade, and who regretted his inability to be present that day. He stated that thirty years ago his firm adopted the plan of meeting the men periodically to discuss their common interests, and that since that time there had not been a single strike or dispute between them. The same honourable member was largely concerned in the iron trade, and had 10,000 workmen employed, directly or indirectly, under his direction. He and several intelligent ironmasters of Stockton, Middlesborough, &c., managed matters without strikes by appointing Boards of Arbitration, who met and settled matters amicably between masters and men. Ten years ago he (Mr. Mundella) stood almost alone in recommending these Boards of Arbitration, and now there were fifty of them in different parts of the country. After referring to the spread of co-operative societies among the working men, and the extent of their operations, the honourable member said he appealed to his countrymen to give what aid they could to put an end to the disastrous conflict between labour and capital. Masters and workmen ought to be equally free by law to combine, and all that was necessary was to *guard well the rights of third parties who might be interested.*

We have given these extracts because they embody the opinions of representative men on one of the most important questions of our time.

Circular to Gas Companies.

THE Imperial Gas Company's Bill, as passed by the House of Lords, met with no opposition in the Commons, and, together with the South Metropolitan Company's Bill, has received the Royal Assent. The success that has thus attended the firm resistance of the Imperial Company to the unjust and unreasonable exactions attempted to be forced on them as a condition to granting them power to raise additional capital to carry on their undertaking, will be hailed with satisfaction by all gas companies in the kingdom, on whom, under like circumstances, similar exactions might be attempted to be enforced. The report of Mr. Cardwell's committee, which has served as a bugbear to deter the metropolitan gas companies from applying to Parliament, may now be set at naught, and there is reason to hope that the gas Bills to be hereafter submitted to Parliament will be considered freely on their own merits, without forcing them to fit the Procrustian bed constructed for them by Mr. Cardwell's committee. This highly satisfactory result may be attributed chiefly to the effect produced on the committees of both Houses by the powerful evidence of Mr. Burke, whose professional experience enabled him to bring the practical knowledge gained during the many years he was director and governor of the company to bear on the subject clearly and convincingly. As stated by Lord Methuen, the chairman, the committee of the House of Lords "felt bound "to express themselves as strongly as they could that they "considered the evidence of Mr. Burke to be very conclusive "on the question;" and on the following day, when it was proposed, on behalf of the nine petitioners against the Bill, to

call other witnesses, the committee were unanimously of opinion that it would be unnecessary to call further evidence. The counsel for the Metropolitan Board of Works contended that, unless the Imperial Gas Company could show some exceptional circumstances, they ought to supply gas on the same conditions as the Chartered Company will be compelled to do by the Act of last year, and that there were no such circumstances to induce the Legislature to give them an indulgence which the City gas companies did not enjoy. It was also contended that the gas consumers in all parts of London should be supplied with the same quality of gas at the same price, and that no difference ought to arise from the accident of residence. The same argument, slightly extended, would apply to the gas consumers in all parts of the kingdom, and it has been again and again urged by all agitators for cheap gas. But the different circumstances of two gas companies in adjoining districts may afford as reasonable a ground for difference of price or of illuminating power as there exists between Plymouth and Cork, or Devonport and Liverpool. Notwithstanding the decided *animus* against the gas companies that seemed to actuate Mr. Cardwell's committee—which was manifested to such an extent that the chairman was on one occasion betrayed into exclaiming "Hear, hear," to the remarks of adverse counsel—there was one principle established by their report, for which gas companies have not been sufficiently grateful, and the recognition of which ought to reduce all gas inquiries to mere questions of detail. The broad principle was laid down, though somewhat ungraciously, that the original shareholders of all gas companies, under the Gas-Works Clauses Act, are entitled to receive 10 per cent. dividends out of the profits, when their undertakings have been conducted with due care and management. The admission of that principle is altogether inconsistent with enforced equality of price and illuminating power. Whether, as in the case of Plymouth, the companies have become possessed of their works under exceptionally favourable circumstances, or whether, as in the case of the South Metropolitan Gas Company, a large portion of former profits was applied to capital, the companies are in either case enabled to supply gas at a very low rate, and maintain their dividend of 10 per cent. The gas consumers whose "accident of residence" places them in those favoured districts, enjoy the advantage of such antecedent arrangements; but the resident of an adjacent district has no reason to complain because the gas company who supply him are not so fortunately circumstanced. The 10 per cent. test has not yet been applied to the City gas companies, and it will be time enough to call on the Imperial Gas Company to show exceptional circumstances why they should not be compelled to supply gas on the same terms as those companies, when it has been practically proved that a supply of 16-candle gas for 3s. 9d. per 1000 feet, in London, is compatible with 10 per cent. dividends.

The Government Valuation of Property Bill, for providing "a common basis of value for the purposes of Government "and local taxation, and to promote uniformity in the assess-"ment of rateable property in England," has been withdrawn, as it was found to be impossible to pass it this session. A similar Bill, limited in its operation to the metropolis only, has, however, been introduced, and is being pressed through its various stages in the expectation of its being passed.

The Chartered Gas Company's new works are making rapid progress. The arrangements have been designed by their chief engineer, Mr. F. Evans, with strict regard to convenience and the saving of labour and expense; and the gas-works at Beckton promise, when completed, to be among the most perfect of the kind yet constructed. In a recent number of the *Engineer*, a minute description is given of the design and progress of the work, from which we glean the following particulars:—The site selected is on the bank of the Thames, west of Barking Creek, and adjoining the land occupied by the works of the northern drainage outfall. One hundred and fifty acres have been purchased by the company, 30 acres of which are now being covered with the actual gas-works. On the river side the premises have a frontage of 1500 feet, of which 900 feet will be occupied by a river-wall forming a spacious terrace or wharf. Considerable difficulty was experienced in getting a good foundation for the buildings, it being necessary in some places to sink 35 feet, and in none less than 22 feet below the surface, to reach a solid stratum. The general level of the ground is being raised 5 feet, so as to bring it up to the Trinity high-water mark, the top of the river-wall being raised 5 feet higher, or 10 feet above the general level. A pier is to project from the middle of the river wall 400 feet, having a curvilinear course of 800 feet. It is to be composed of cast-iron cylinders, 6 feet in diameter and 60 feet high, to be surmounted with wrought-iron girders, so as to form a support for several lines of railway that will traverse the pier. The colliers will discharge their cargoes by means of six steam or hydraulic cranes into the trucks on the rails, which will be drawn by a locomotive engine along a viaduct raised 23 feet above Trinity high-water mark. This railway, after passing over the pier, will "fan out" into several branches, and the coals, when conveyed directly to the retorts, will be deposited on stages on such a level as to facilitate the charging. A "low-level" railway, running through the centre of the works, will carry off the coke to the wharf. There are to be four retort-houses, arranged in two lines, each one being 360 feet long by 90 feet wide, inside dimensions; and each retort-house will contain 30 beds of retorts of nine in a bed. Thus, as at present arranged, there will be 2160 mouthpieces; the distilling power being equal to 1000 tons of coal per day, or a gross production of 10 million cubic feet of gas. Tanks 10 feet wide and 1½ foot deep will extend the whole length of the retort-houses on each side, just below the edge of the roof, to gather the rainfall to be available for the boilers of the steam-engines. All the arrangements for the exhausters, engine-house, &c., are in duplicate, so that one half of the establishment could be worked independently of the other half. Each of the two purifying-houses will cover an acre and a half of ground, including space for scrubbers. There are to be four single gasholders, contiguous to each other, and placed in a line. They will each have a diameter of 180 feet, and be 40 feet deep, the estimated capacity being 1 million cubic feet. The other gasholders, in London, will hold collectively 6,500,000 cubic feet, thus affording a total storeage of 10,500,000 cubic feet, or 500,000 more than the greatest daily consumption of the Chartered and of the City of London Gas Companies combined. From Beckton the gas will be conveyed in a huge 4-feet main to the Chartered Company's station in Brick Lane, an exhaust-pump being used to expedite the flow of the gas. The length of this 4-feet main—a size unparalleled in gas-making—will be eight miles and a half; and three more miles of main, 3 feet in diameter, will convey the requisite supply to the station at Westminster. The entire cost of the undertaking is estimated at £600,000, and it is expected that all will be completed for the manufacture and supply of gas by the autumn of next year. It is further observed that the whole of the arrangements admit of an extension sufficient to meet any demand that London can possibly make in reference to the supply of gas.

Mr. T. N. Kirkham, of the Imperial Gas Company, has prepared a valuable table of experiments, showing the variations in light-giving power of different burners in common use. In these experiments gas of uniform quality was employed as the standard of comparison. It had in illuminating power of 14·32 candles, consumed at the statutory rate by a Sugg-Letheby burner, at a pressure of ·085 inch at the point of issue. We may presume that the gas was burned at the same rate in all the Argands, but the pressure at the point of issue varied, and thus some of the burners appear at a disadvantage. The Bengel burner, for example, with a pressure of ·260 inch at the point of issue, gave only 12·46 candles; and Evered's iron, with a pressure of ·355 inch, gave a light of only 9·24 candles. The new "London" burner experimented with showed an increase in illuminating power of only 9 per cent. above the Sugg-Letheby; but Mr. Kirkham explains that this was the first of the kind made. It has since been improved, and, as our readers know, gives at least 16 per cent. more light. The variations in the case of Argands were from 15·62 to 9·24 candles; and the pressure at the point of issue varied from ·085 inch to ·355 inch. With bat's-wings the variations were much greater; Sugg's lava burner, No. 12, gave the light of 13·27 candles, being a decrease of only 7·4 per cent. on the standard Argand, while a common No. 5 iron gave only 5·41 candles, showing a decrease of light equal to 62·26 per cent. In fishtails the variations were just about the same as with bat's-wings. They will be shown best by taking the results with burners professedly of the same kind, No. 4 iron. One of these burners showed an illuminating power of 11·11 candles, two others gave only 9·36, while a fourth gave but 6·43 candles; the pressure at the point of issue in this last case being ·975 inch. These represent burners purchased indiscriminately, and the moral is

obvious enough. It would seem that the public would profit more from the inspection of burners than the inspection of meters. The following is the table *in extenso*:—

Table of Experiments made by Mr. Kirkham to Test the Illuminating Power of a Uniform Quality of Gas consumed through a number of different Burners, such as are in common use by the Public.

The gas used as a standard of comparison was gas of a constant illuminating power of 14·32 candles, consumed at the rate of 5 feet per hour, through a 15-hole Argand burner (Sugg-Letheby), at a pressure of ·085 of an inch at the point of issue.

No. of Burners Tested.	Description of Burners.	Illuminating Powr. in Candles.	Variations in Candles. Incr.	Variations in Candles. Decr.	Per Centage of Variation. Incr.	Per Centage of Variation. Decr.	Pressure at Point of Issue.
	Argand Burners.						
1	Standard Sugg-Letheby (15-hole)	14·32	..	..	..	..	·085
2	Sugg's patent London (24-h.)	15·62	1·3	..	9·09	..	
3	New German steatite	14·32	..	..	..	..	·285
4	Hall's patent (with gauze)	12·68	..	1·64	..	11·5	·315
5	German porcelain	12·57	..	1·75	..	12·28	·240
6	Bengel burner (French stan.)	12·46	..	1·86	..	13·04	·260
7	Sugg's patent London (32-hole, for rich gas)	12·25	..	2·07	..	14·52	
8	Hall's patent (without gauze)	9·43	..	4·89	..	34·21	·335
9	Evered's iron	9·24	..	5·08	..	35·48	·355
	Variations from 15·62 *to* 9·24.						

No. 2.—This was the first burner of this kind made. It has since been improved.
No. 7.—This burner is made to consume 7½ feet of common gas or 5 feet of cannel gas per hour, and is, therefore, placed at a considerable disadvantage when burning so small a quantity as 5 feet *common* gas only, showing that, although the burner is good, yet there will be loss of light if improperly used.

	Bat's-wing Burners.						
10	Lava bat's-wing, No. 12, Sugg's new burner	13·27	..	1·05	..	7·4	·175
11	Do., No. 10	13·02	..	1·3	..	9·09	·250
12	New German, filled with wool	13·02	..	1·3	..	9·09	1·180
13	New Brönner's pat. bat's-wg.	13·02	..	1·3	..	9·09	·970
14	Amsterdam, Sugg's (made for the City of Amsterdam)	12·79	..	1·53	..	10·71	·260
15	New, No. 8, Sugg's	12·79	..	1·53	..	10·71	·280
16	New, No. 6, Sugg's (for 18-candle gas)	12·04	..	2·28	..	15·96	·380
17	New, No. 4 { cannel	10·61	..	3·71	..	25·92	·650
18	New, No. 3 { cannel	9·09	..	5·26	..	36·7	·710
19	No. 5, iron	5·41	..	8·91	..	62·26	1·158
	Variations from 13·27 *to* 5·41.						

Nos. 17 and 18.—Made for cannel gas. These show the effect of using burners suitable for cannel gas for the consumption of common.

	Fishtail Burners.						
20	No. 4, iron	11·11	..	3·21	..	22·48	·52
21	Hart's patent gas economizer	10·46	..	3·86	..	27·	·77
22	Hart's patent	10·23	..	4·09	..	28·57	·87
23	No. 3, iron	10·23	..	4·09	..	28·57	·56
24	Morley's patent	10·02	..	4·30	..	30·07	1·5
25	Iron	9·81	..	4·51	..	31·5	·635
26	Hart's patent gas economizer	9·75	..	4·57	..	31·97	·84
27	No. 4, iron	9·36	..	4·96	..	34·64	·69
28	No. 4, iron	9·36	..	4·96	..	34·64	·565
29	No. 5, adamas	9·07	..	5·25	..	36·7	·66
30	New Birmingham iron	7·16	..	7·16	..	50·	·82
31	No. 5, iron	7·7	..	6·62	..	46·52	·8
32	No. 3, iron	7·02	..	7·3	..	50·98	1·
33	No. 4, iron	6·43	..	7·89	..	55·15	·975
34	No. 4, iron union jet	6·37	..	7·95	..	55·55	1·165
35	No. 4, iron	6·37	..	7·95	..	55·55	·997
36	No. 4, iron	6·03	..	8·29	..	58·33	·9
37	No. 3, iron	5·56	..	8·76	..	61·24	1·13
38	No. 3, iron	4·67	..	9·65	..	67·42	1·575
39	No. 3, iron	4·31	..	10·01	..	69·96	1·245
	Variations from 11·11 *to* 4·31.						

Note.—In comparing the results obtained from fishtail and bat's-wing burners with those obtained from Argands, it must be borne in mind that the two former give more light from the flat of the flame than from the edge, and that the illuminating power recorded above is that emitted from the flat of the flame. Argands give the same amount of light in all directions.

Where the same numbers or names of a burner are mentioned more than once, they represent different samples of the same burner purchased indiscriminately.

It is almost too bad to tantalize Londoners of the present generation with the idea of coal at the pit's mouth close by, but we are far from denying that it may not be a possibility of the future, when it will pay to drive a shaft a mile or more down, and bring up coal that distance from a narrow seam. Be that as it may, it is, from every point of view—practical and scientific—greatly to be desired that Mr. Bazalgette will be allowed the means of going on with the boring at Crossness. Whether coal is found or not is a matter of small importance, except in a scientific point of view; but it will be valuable to know whether the lower greensand is continuous under London, and if it can be depended upon for an unlimited supply of water. In the meantime, it is curious to note how deep the idea of the sewage contamination of water has sunk into people's minds. Water comes up from great depth, smelling of sulphuretted hydrogen, and the conclusion is directly jumped to that sewage must have penetrated to the source. The fact of the presence of sulphuretted hydrogen is not without significance, since it indicates, in the absence of volcanic action, the reduction of sulphates and the possible presence of organic matter; but the assumption of "sewage contamination" is perfectly gratuitous.

Correspondence.

RELATIVE CHEAPNESS OF GASLIGHT.

Sir,—It would be much more satisfactory to learn the cost of a certain quantity of light from any gas, than merely to know the price of 1000 cubic feet of it, which gives no insight whatever into its cheapness or dearness. The first of these can be derived from the second by an arithmetical calculation in which the illuminating power of the gas is taken into account. For instance, the price of 1000 feet of London gas is 4s. Five cubic feet give the light of 12 standard candles burning for one hour, or 1000 feet will give the light of 2400 such candles. If we adopt the light of 1000 standard candles as the standard quantity of light to be used in all cases for comparison, we have the proportion—

Candles.		d.		Candles.		d.
2400	:	48	::	1000	:	20

Twenty pence is therefore the price of that quantity of London gas which will give the light of 1000 standard candles.

This calculation must be made every time a person wishes to know the relative cheapness of the gaslight from any gas establishment, and it is to save this perpetual repetition of the same calculations that I venture to suggest that these should be made once for all, and thrown into a tabular form. To show the utility of such a table, I beg leave to make use of the table prepared by Mr. Hughes, and corrected by you in your Journal of the 25th of June, 1867, showing the prices of gases of eighteen different towns by 1000 feet, and their illuminating powers. I have added an additional column showing the price of that quantity of gas which will give the light of 1000 candles. I have also taken the liberty of arranging the towns in the table according to the cost of their light.

Name of Town.	Price p. 1000 Feet.	Illuminating Power.	Price of that Quantity of Gas which will give the Light of 1000 Candles.
Ipswich	3s. 9d.	14 candles	16·07d.
Brighton	3 6	14 ,,	15·00
Leicester	3 6	14 ,,	15·00
Sheffield	3 6	14 ,,	15·00
Derby	3 5	14 ,,	14·64
Plymouth	2 9	12 ,,	13·75
Preston	4 2	18 ,,	13·88
Birmingham	2 9	14 ,,	11·78
Walsall	2 8	14 ,,	11·43
Rochdale	4 0	21 ,,	11·44
Nottingham	3 0	16 ,,	11·25
Manchester	3 2	17 ,,	11·17
Blackburn	4 0	22½ ,,	10·78
Edinburgh (Old Co.)	4 10	28 ,,	10·35
Salford	3 4	20 ,,	10·00
Stockport	3 6	22 ,,	9·54
Glasgow (Old Co.)	4 2	27 ,,	9·26
Liverpool	3 0	22 ,,	8·18

A Subscriber.

THE GAS REFEREES AND MR. HEISCH.

Sir,—Your correspondent, Mr. G. Howell, has so completely misunderstood both the nature of my objection to the gas referees method of carrying out the ammonia test, and the nature of the process itself, that his letter would hardly be worth notice were it not that by leaving it unanswered I might be supposed to accept his criticism. I must, therefore, trouble you with a few words in reply. I will not enter on the question of whether my objection to the ammonia test is the most important one or not, though on this point I differ from Mr. Howell. The relative strengths of the solutions of sulphuric acid and ammonia used in testing can in no way affect the quantity of ammonia contained in the gas tested; and so long as 1-10th of 25 is 1-40th of 100, so long, if you estimate the amount of ammonia contained in 1-10th of 25 cubic feet of gas, must you multiply it by 40 to know the quantity in 100 cubic feet, and any error in the first determination must be multiplied by the same amount. The use of a dilute solution of ammonia may reduce the error to a minimum, but cannot affect the quantity by which it is multiplied. The solution of ammonia employed contains 1 grain in 100 measures; each measure, therefore, contains ·01 grain, and whether the quantity of sulphuric acid which this will neutralize occupies the same bulk or 100 times the bulk, makes no difference to the delicacy of testing.

As an abstract matter of chemistry, I make no objection to the delicacy of the test; but any one of any experience in such matters knows the great, and in my opinion very just, dislike that exists to inflicting penalties except on the most incontrovertible evidence; and I cannot consider evidence drawn from such minute quantities suited for the purpose. If the gas contain even one-fifth more ammonia than is allowed by the referees, its amount must be estimated from a quantity not exceeding ·025 grain; and as I hold that it would be most unfair to the companies to inflict a penalty on the evidence of such a quantity, so I think it unfair to the public to prescribe such a mode of testing as precludes the obtaining of better evidence. It has been customary to continue the operation for three or four days, so as to use about 100 feet of gas, in which case, without using an out-

rageously large quantity of liquor, a satisfactory amount of ammonia is condensed. Why should the referees depart from this custom?

CHAS. HEISCH.

City of London Gas Examiner's Office,
37, Jewry Street, E.C., July 17, 1869.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, JULY 5, 1869.

The MILNROW GAS Bill.—The Commons amendment was considered, and agreed to.

The BRADFORD WATER Bill was reported from the Select Committee, with amendments.

The MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT, and the ST. HELEN'S BOROUGH IMPROVEMENT Bills, were read a third time, with the amendments, passed, and sent to the Commons.

TUESDAY, JULY 6.

The ABERDARE AND ABERAMAN GAS, and the WALTON-ON-THAMES AND WEYBRIDGE GAS Bills, were returned from the Commons, agreed to, with amendments. The said amendments considered, and agreed to.

The OXFORD GAS Bill was returned from the Commons, agreed to, with amendments.

The KEIGHLEY WATER; IMPERIAL GAS; and the SOUTH METROPOLITAN GAS Bills, were read a third time, with the amendments, passed, and sent to the Commons.

THURSDAY, JULY 8.

The BRADFORD WATER Bill was read a third time, with the amendments, passed, and sent to the Commons.

FRIDAY, JULY 9.

The CLEVELAND WATER, and the HUDDERSFIELD WATER Bills, were returned from the Commons, with the amendments agreed to.

The WEST SURREY WATER Bill was returned from the Commons, agreed to, with an amendment. The said amendment considered, and agreed to.

The SLIGO BOROUGH IMPROVEMENT Bill was reported specially from the Select Committee, with amendments.

The OXFORD GAS Bill.—Commons amendments considered; some of the amendments disagreed to; and a committee appointed to prepare reasons to be offered to the Commons for the Lords disagreeing to certain of their amendments to the said Bill; the committee to meet forthwith. Report from committee of reasons prepared by them, read, and agreed to, and a message sent to the Commons to return the said Bill, with the reasons. The Bill was afterwards returned from the Commons, with a message that they do not insist upon their amendments to which the Lords have disagreed.

MONDAY, JULY 12.

The Royal Assent was given to the following Bills:—The MARYPORT TOWN AND HARBOUR GAS; MILNROW GAS; ABERDARE AND ABERAMAN GAS; WALTON-ON-THAMES AND WEYBRIDGE GAS; CLEVELAND WATER; HUDDERSFIELD WATER; WEST SURREY WATER; MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT; ST. HELEN'S BOROUGH IMPROVEMENT; and OXFORD GAS.

The DORKING WATER Bill.—The Commons amendments were considered, and agreed to.

TUESDAY, JULY 13.

The IMPERIAL GAS, and the SOUTH METROPOLITAN GAS Bills, were returned from the Commons, with the amendments agreed to.

THURSDAY, JULY 15.

The SLIGO BOROUGH IMPROVEMENT Bill was read a third time, with the amendments, further amendments made, Bill passed, and sent to the Commons.

The EDINBURGH AND DISTRICT WATER Bill was read a third time, with the amendments, passed, and sent to the Commons.

The BRADFORD WATER Bill was returned from the Commons, with the amendments agreed to.

HOUSE OF COMMONS.

MONDAY, JULY 5, 1869.

The ABERDARE AND ABERAMAN GAS, and the WALTON-ON-THAMES AND WEYBRIDGE GAS Bills, were read the third time, and passed, with amendments.

The DORKING WATER, and the WEST SURREY WATER Bills, as amended, were considered.

TUESDAY, JULY 6.

The OXFORD GAS Bill was read the third time, and passed, with amendments.

THURSDAY, JULY 8.

The CLEVELAND WATER and the HUDDERSFIELD WATER Bills.—The Lords amendments were agreed to.

The WEST SURREY WATER Bill was read the third time, and passed, with an amendment.

FRIDAY, JULY 9.

The MANCHESTER CORPORATION WATER-WORKS AND IMPROVEMENT, and the ST. HELEN'S IMPROVEMENT Bills.—The Lords amendments were agreed to.

The DORKING WATER Bill was read the third time, and passed, with amendments.

MONDAY, JULY 12.

The IMPERIAL GAS; KEIGHLEY WATER; and SOUTH METROPOLITAN GAS Bills.—The Lords amendments were agreed to.

TUESDAY, JULY 13.

The TRURO WATER Bill was reported, without amendment.

WEDNESDAY, JULY 14.

The BRADFORD WATER Bill.—The Lords amendments were agreed to.

HOUSE OF LORDS.

(*Before Lord* METHUEN, *Chairman; the Duke of* GRAFTON, *Earl* DARTMOUTH, *Viscount de* VESCI, *and Lord* FITZWALTER.)

IMPERIAL GAS BILL.

THURSDAY, JULY 1.

Mr. HOPE SCOTT, Q.C., Mr. DENISON, Q.C., Mr. RICHARDS, Q.C., and Mr. BURKE appeared as counsel for the bill; Mr. RODWELL, Q.C., and Mr. CRIPPS for the Metropolitan Board of Works; and Serjeant SARGOOD for certain ratepayers, petitioners against the bill. There was a petition from the vestry of Paddington, in opposition, but no counsel appeared to support it.

Mr. HOPE SCOTT said this bill was intituled "An Act to authorize the Imperial Gaslight and Coke Company to raise more money and to purchase more land, and for other purposes." The three main objects contemplated by the bill were the increase of capital, power to construct new works, and to acquire land for that purpose, and also statutory power to manufacture residual products, and to own and use trucks, colliers, and other accommodation for the purpose of cheapening and facilitating their coal business, which, of course, in connexion with their gas business, was one of very great importance and magnitude. Having given those three general heads, he would now proceed to give their lordships some account of the company's history, and what led to the present application. The Imperial Gas Company supplied one-fifth of the metropolis, and its area extended over 25 square miles. The gas is supplied from three manufacturing stations—at Fulham, Shoreditch, and St. Pancras. The company have also two store stations where gasholders are kept, the one at Fulham being in a comparatively open district, and the other two—the Shoreditch and St. Pancras manufacturing districts—are in the midst of a considerable population and numerous buildings. On one heavy working day in 1868 the comparative carbonization of coals in the three different districts was as follows:—Fulham, 591 tons; Shoreditch, 500; and St. Pancras, 474; the smallest of these consumptions being larger than any other London works. In 1868 the total gas manufactured was 3018 million cubic feet; the quantity sold was 2662 million cubic feet, the difference being 356 million, and indicating a difference between the production and the sale of 12 per cent., which was about the lowest per centage found in any gas company. It used to be called "leakage," but it had been found to include a great deal beyond that—viz., gas used at the stations, gas stolen, losses by leakage, evaporation, and other causes; and it was now pretty well known that hardly any company, especially with a large district, could reckon upon a less loss than 12 per cent. before they could get a money return. In 1868 the coals used by the Imperial were 311,963 tons, and their lordships would see that their coal business was one that should be facilited by all reasonable means, they being the largest gas company, and showing the largest consumption probably of any private company in the kingdom. The gas obtained from those coals was about 9673 cubic feet per ton. Each ton produced in gas sold 8533 feet, being the 12 per cent. difference referred to. The number of meters in 1868 was 65,519; total length of mains, 631 miles. They supplied 65,738 inhabited houses, the average increase for the last seven years being at the rate of 3230 houses per annum. Last year the addition was 4000 houses, and, taking six as the population of London houses, represented 24,000 additional persons. The total receipts for 1868 were—gas-rental, £531,759 17s. 10d.; meter-rental, £10,668; sale of old materials, £1668; residual products, £99,595; and miscellaneous receipts, £60: making a total of £644,358. The company's capital at the end of 1868 was—in shares, £1,455,433; loans, £585,299: total, £2,040,732. The coals carbonized in one week in the heaviest time of the year were 10,172 tons; coke for sale, 575 chaldrons; workmen's wages, in one week, £2828 17s. 11d. (2324 men). Their lordships would readily conceive that an enterprise like this could not have grown to its present magnitude in a day; it began as far back as 1821. The first gas Act for London was obtained in 1812. That was the Chartered Company. In those old days Parliament did not incorporate directly, but facilitated incorporation by the Crown. Under its first Act it was empowered to raise £250,000 in shares, but two years later, in 1823, it was obliged to come for £250,000 more, and by 1829 it came for £150,000 more, so that up to 1829 its capital sanctioned by Parliament was £650,000. According to the modern way of proceeding, that amount of capital would have been unnecessary; but in those days no borrowing power proportioned to the share capital was given, at any rate, to companies of this kind. Everything that was done had to be done out of share capital. One result of no borrowing powers being allowed was, the profits of income were applied for the purpose of supplying what was necessary beyond the share capital, and as much as £280,000 had been spent out of profits before the year 1854. That was subsequently allowed to be capitalized, but with the restriction that no more than £13,000 a year should be applied in the payment of interest or dividend upon that capitalized sum of £280,000, which would be at the rate of 3¼ per cent. Had the money been raised originally as capital, it would have been entitled to the 10 per cent. commonly allowed at present; and, in fact, previous to 1854 there was no restriction upon dividend whatever, so that the company practically suffered to the extent, inasmuch as by not having sought capital powers to carry on their business, but spending out of profits, they delayed the period of capitalization till it became a grace and favour on the part of Parliament, who imposed a restriction, which was a dividend of 3 or 4 per cent. upon what might have earned 10 per cent. if it had been raised in previous years, and had become *bonâ fide* capital of the company. In 1854, notwithstanding this intermediate expenditure out of profit, the company was obliged to make a further application for capital amounting to £650,000, doubling the share capital as it stood in 1829.

A MEMBER of the COMMITTEE: Was that in addition to what they capitalized out of profits?

Mr. HOPE SCOTT said it was; but the capitalized £280,000 would be no longer available, it had been spent, therefore what they wanted was further capital to carry on the concern. It represented what had been spent between 1829 and 1854, but, of course, it had been absorbed, the money was not to be raised, it was capitalized in respect of expenditure, and in 1854 they got £650,000 more of capital. They got then, for the first time, power of borrowing in the usual proportion to the total capital, which was thus made £1,300,000—viz., the first £650,000, and the second £650,000, and thereby entitled them to a loan power of £430,000. It might be said that the direct capital power given for expenditure by Parliament, apart from the £280,000 of irregular expenditure, was then £1,733,000, and the rate at which that capital had been absorbed had, of course, varied according to the progress of the business. From 1829 to 1865 the draft upon capital annuity was about £35,000; since 1860 the annual demand upon their capital has been at the rate of £100,000 a year, and is likely to be before long £160,00 a year. The company's area indicated on the map,

within the memory of their lordships, was a very thinly populated one, the northern part being suburban. They had the disadvantage, in the first instance, of having large distances to travel with a small quantity of consumers compared with the distance, and in that respect they are still at a disadvantage in comparison with some of the more densely populated districts—the City of London, for instance, where the houses touch each other; but, passing through a thinly populated district, there must be intervening spaces of many hundred yards between the houses they had to supply, and that, of course, was against the company, inasmuch as all their fixed capital was proportioned to the area, or a great part of it was. The consumption was sparse and irregular, and that accounted for the rise in the demand upon the capital from £35,000, between 1829 and 1865—it would account for the rise to the £160,000, which was now believed necessary to keep pace with the annual increase of consumption in that district. It was not due merely to the increase of population or buildings, but to the nature of those buildings and a change of taste in a large portion of the better classes as to the use of gas. It was not only used for lighting much more generally now than formerly, but for warming and cooking. The consumption had increased as follows:—In 1830 the total quantity of gas supplied was 216 million feet; in 1840, 448 million feet; 1850, 898 million; 1860, 1982 million; and in 1868 it was 3018 million. With regard to price, 1000 cubic feet were paid for in 1824 by 15s.; in 1830 it was 13s. 6d.; in 1833, it was 12s.; 1834, 10s.; 1837, 9s.; 1843, 8s.; 1845, 7s.; 1848, 6s.; 1851, 5s.; 1852, 4s. 6d.; and in 1855 to 4s., at which it now stood. These reductions were not attributable to any great change in the prices of material or labour. The prices for coal and coke used for gas purposes had remained remarkably steady; they had risen rather than fallen in the fluctuations that had taken place. Wages had distinctly increased, and gas companies were also increasing. The reason a reduction had been possible in the case of the Imperial Gas Company had been that its district had been gradually filled up by its mains, which produced little return before, but are now, by the increased population, giving a better return. Economy of a better kind had been introduced into the manufacture of gas in some respects, and also considerable improvement. Those were the causes to which he would ascribe and would prove this gradual reduction in price. The decrease in cost was not attended by a decrease of quality. On the contrary, the illuminating power of gas increased with the decrease of price. He believed there was no standard illuminating power previous to 1851. All the companies were comparatively of ancient date, and that was the first company coming for the first time for powers in the metropolis which became subject to the parliamentary standard. That standard was 12 wax candles. Sperm candles were since introduced, which implied a considerable increase of illuminating power. The gas was usually described as burnt in a particular kind of Argand burner—that was to say, that, taking the special burner described in the Act, they were to produce a light equal to the 12 candles. Their lordships would find that this question of the burner would subsequently be very material. In the year 1854 the Imperial adopted the standard—having no previous one—of the Great Central Gas Company of 1851, of 12 wax candles. In the Metropolis Gas Act, 1860, the standard was raised from 12 wax to 12 sperm candles, which was practically raising the illuminating power about 10 per cent. The proposal in the present bill was to adopt 14 sperm candles. He had already referred their lordships to the Act of 1860; and the truth was, that from the year 1855 or 1856 downwards the particular amusement of the inhabitants of the metropolis had been that of hunting the gas companies, which they had done with a degree of vigour not yet exhausted. From that time the agitation had been continued and unremitting, the whole force of the metropolis being brought against the gas companies to lower their profits, and put the difference in the pockets of the ratepayers. The agitation in 1860 had reached a point which produced a bill that was introduced hostilely to the companies by the ratepayers, for the purpose of imposing terms upon all the metropolitan gas companies. That bill was met by the companies in committee, and the result of what took place there was, that an agreed bill was passed, in which very large concessions were made to the consumers, and in which, also, certain protections and privileges were given to the companies. Although originally founded upon the idea of competition, the different companies have gradually arranged among themselves to confine their supplies to particular districts; and the companies were prevented, by the Metropolis Gas Act of 1860, each from going beyond its own district. Means, however, were left for bringing in new companies, by making an application to Government, and by showing that the existing companies had not done their duty within those districts. That was one of the effects of the Act of 1860. Then all the gas companies were brought under the Gas-Works Clauses Act of 1847, which contained a variety of provisions for the protection of the public, the practical working of which, as regarded price, was that whenever the dividend of the company exceeded 10 per cent., after putting by a reserve-fund, and making proper arrangements of all kinds for the supply to their works, the difference was to go in reduction of the gas-rates. The price of gas, also, was limited to 4s. 6d. per 1000 feet in the metropolis, the price being 5s. 6d. in the country districts—that was, the suburban districts—under special circumstances, where the consumption per mile of pipes was much lower than in the urban districts, or within the metropolis. The Imperial was, of course, within the latter, having a large suburban district to supply; and, of course, in that case, there was also a regulation on the part of the companies. This was not an immaterial point. The companies were compelled to furnish a supply of gas in all parts of their districts whenever they were required to do so. Of course that obliged an expenditure of capital whenever a supply of gas was demanded by the consumers, and that has been one of the reasons undoubtedly, that led several of the companies (the Imperial among the rest) to come to Parliament for further capital powers. The Gas Act of 1847, when it spoke of restricting the dividend to 10 per cent., meant that the dividend of no one year should exceed 10 per cent., but in case the dividend fell below 10 per cent. in any one year, then in any future years the company was entitled to take from the income which exceeded 10 per cent. for that current year such a sum as was left to recoup the back dividend. Under that Act the companies were enabled to go back over the whole history of their undertaking, and continuously make up 10 per cent. upon those dividends.

A MEMBER of the COMMITTEE: Not confined to any number of years?

Mr. HOPE SCOTT said it was not confined to any number of years. In many of the gas companies which came under that Act at present, they would be found going back for 10 or 15 years, thus absorbing all the surplus beyond the 10 per cent., if they were earning it, to recoup the back dividends. It was a common law right. The Gas Clauses Act of 1847 was the common law of gas companies, but under the Act of 1860 the public got the additional advantage that the recouping of arrears of dividends was limited to six years. In the case of the Imperial the loss upon that single item was £167,000 struck out from their power of recoupment by the limitation to six years. The average dividend paid from 1824 to 1844 was 9 per cent; from 1845 to 1853, 9 per cent. From 1854 to 1868 they had attained only their full average of 10 per cent., so that there was a considerable number of years which they might have pleaded for recoupment, but which were cut down to six years, and those six years dating immediately back from the date of the Act. That was the legislation of 1860, and there was no doubt at all but what that Act was a compromise. It could not have been passed otherwise, and it had been admitted by Mr. Cardwell as having been a contract, and one which could not be disturbed without the consent of the gas companies. In 1866 the whole matter was thoroughly gone into, and this compact was made under that Act of Parliament. Their lordships had heard what was got both by the public and the companies, and by that Act the company thought they would be allowed to be guided and regulated, at any rate, for a considerable time, instead of finding, only a few years later, it was all to be ripped up again, and new legislation attempted against them. He would now pursue the separate history of the Imperial Company. In 1865, their last capital Act having been in 1854, they found it necessary to go to Parliament for further capital, and they then sought power to raise £1,300,000 in share capital, with proportionate borrowing powers; in other words, to double their capital as it stood under the legislation of 1854. He dared say they might have got that money at that time, and certainly the House of Commons was in favour of granting it; but, although it failed in the House of Lords, it was not upon the question of capital. The company have land at Fulham, which could have been applied to further purposes in the manufacture of gas; but in the House of Lords the then Bishop of London opposed, on the ground of the inconvenience and nuisance to the neighbourhood by the increase of productive works at Fulham. His opposition was successful in the body of the House (not in the committee), and that bill was rejected on the second reading. Now, the company had joined with their wish to increase their power of production at Fulham a plan for getting additional lands at Hackney, and that was involved in the same fate as the Fulham land, the bill being lost on the second reading, and no distinction had been taken between the capital powers, or between Fulham and Hackney, or places at which gas could be manufactured. The company were obliged, then, to come the next year—in 1866—and they renewed their application for capital to the extent of £1,300,000; but they dropped out Fulham, upon which they depended in 1865, and proposed to confine their new works entirely to Hackney. The bill began in the House of Lords, and was conceded, but when it got to the Commons the Metropolitan Board of Works, combined with the vestries and inhabitant ratepayers, declared they had an objection to make that the nuisance to Victoria Park, in the east end of London, would be such that the company ought not to be allowed to put any works there. The bill was accordingly thrown out. On both occasions the capital question was thoroughly investigated, and I may say the two Houses had sanctioned the raising of the £1,300,000 more capital. The case was too urgent, as to capital, to allow the loss of the bill in 1866, on the opposition with regard to Victoria Park, to be final, and accordingly leave was obtained to introduce a second bill, in 1866, to raise £325,000, and a proportion (one-fourth) of loan. The company were entitled to 10 per cent. upon their old capital, and they introduced a bill modestly asking for 7½ per cent. This was assented to by the House of Commons, but it was reduced by Lord Redesdale, in the Lords, to 7 per cent., and that although the previous bills of 1865 and 1866 had passed both Houses with 7½ per cent. limit instead of the old 10 per cent. They were obliged to submit, because the urgency was great. Those events led up to the present year, and he would now refer to the objects of the bill more in detail. The capital sought under the present bill was £975,000, with a proportion of borrowing powers. The company now asked for £1,300,000, and in 1865 and 1866 both Houses assented to that—viz., one in one year, and one in the other year. They got £325,000 by the second bill of 1866, and if £975,000 were added to that amount, it would be found that they were asking now, in 1869, for just the same amount asked for in 1865 and 1866, and which, in a sense, Parliament agreed to. No difficulty was raised on the capital. They then asked for £243,750. They wanted to take borrowing power as to the £975,000, which would bring the share capital to exactly the figures of 1865 and 1866.

The CHAIRMAN: That makes it £1,600,000 with the borrowing.

Mr. RICHARDS: I make it £1,625,000.

Mr. HOPE SCOTT said this was reckoned to keep them going for about 10 years, not longer. He had told their lordships that £165,000 a year was the rate at which the company were satisfied they must expend capital, and therefore the capital now taken, added to the capital taken before, would, in fact, only be equal to that expenditure up to 1876; and it was upon that basis that the applications were made. It would be his business to satisfy their lordships of the correctness of the company's calculations. They were bound to give a supply of gas, and therefore the question of giving them capital seemed to be, on the whole, just, since it would be hard they should be bound to make bricks without straw. Their second object was the acquisition of a site in the marshes at West Ham, bounded on the south-west by Bow Creek; and it was always a great object to a gas company to get water communication if they could. All their existing productive works have water access—two by canal, and a third by the Thames. They have gone into the nastiest place they could find, and propose to take 60 acres there, in order that they may keep off that gentility from coming near them which might be offended by their smell. At present the district was occupied by distilleries, iron-foundries, boiler factories, starch-works, chemical works, soap, oil, stearine, naphtha, and manure works; so their neighbours would be hardly able to complain of them.

A MEMBER of the COMMITTEE: It is out of your district, is it not?

Mr. HOPE SCOTT said it was; and the consequence of that was, the company proposed to construct, in connexion with the main going into their district, the pipe and road marked upon the map. With regard to going out of the district, it was a necessity. The sewage pumping-station of the Metropolitan Board of Works was there, and gave agitation to the sewage, and developed everything. It was like bruising the leaf of a fragrant plant. The pumping operation was carried on close by them, and there was no pretence for saying that they would cause the slightest inconvenience to anybody there. Last year the quantity supplied amounted to over 17 million cubic feet of gas in one day—the largest day's consumption—and it was calculated that, if the consumption increased at the past rate, in 1878 the largest day's consumption would be 35 millions. The company therefore proposed to provide on their new site works capable of producing 18 millions for the largest day; and, of course, as the demand increased, those works would be developed. With regard to the residual products, it appeared in evidence before parliamentary committees that the demand for them was very fluctuating indeed. In quite the western district of London there was no regular demand even for coke. The demand there arose from there being a number of washerwomen who resided in

that district, to whom gas coke was valuable for their purposes, but in other districts even the demand for coke was very irregular, and the same observation applied to naphtha and other chemical products. The consequence was that gas companies yards were often encumbered by large quantities of residual products, which they were forced to give away almost to get them out of their way. The company proposed to manufacture the residual products, as far as they were capable of manufacture, and thus get rid of the incumbrances in their yards, and turn all that to the profit of the undertaking, going first to the dividend of the shareholders, and eventually to a reduction in the rate as the consumption became a general one. Upon the same principle they sought power to raise coal, and have the use of railway trucks of their own, and all that would be directed to cheapening their coal. He would give their lordships a short account of the circumstances under which particular demands were made upon the company by the petitioners in that room. The Act of 1860, although admitted and treated as a compact, was by no means so considered by their general opponents in the metropolis; and the results were that two successive bills were introduced, raising the question anew of the terms for gas—not only the money and illuminating terms, but as to the amount of control which was to be exercised over the companies. He had with him the reports of two select committees of the House of Commons directed to this subject. The report of Sir J. Trollope's committee indicated the object for which they were appointed, which was, first, to consider the London Corporation Gas Bill, which was then introduced to enable the corporation to construct gas-works of their own, and to compete with the existing companies who supplied the City. It was perhaps owing to a particular incident that the corporation were moved to do that; at any rate, they had petted and fostered the Great Central Company of 1856, and they thought they had got a company who would be under their control, as it was for a considerable time, and they had a 4s. price established by the Act of 1856. The Central Company were advised that the passage of the Act of 1860, regulating as it did all companies that supplied the metropolis, enabled them to charge what was provided in that Act of 1860, and accordingly they charged 4s. 6d. instead of 4s. That seemed to have moved the corporation, and they initiated a bill in 1866, which was never likely to be passed, but was held out as a threat to the other companies, that they would use the corporate funds, or at any rate the rates of the City, to enable them to compete with them. That was the bill in reference to which Sir J. Trollope's committee was appointed, but they received an instruction from the House to inquire into the operation and results of the Metropolis Gas Act of 1860, thus raising upon the Corporation Bill all the subject-matter of the Act of 1860. The Imperial were certainly misled before that committee, in supposing that they thought the company had made out their case, and, when their report came out, they having abstained from giving further evidence, were not a little disappointed and surprised to find remarks not very favourable to them in that report. That, however, led to nothing immediately, but in the subsequent session the Corporation Bill was rejected. It was understood to be a showing how to draw on the general question, and it was disposed of by them at once. That led to the introduction of another measure, introduced in 1867 by the Government, and called the Metropolis Gas Bill. At the same time both the Chartered and Imperial had bills before Parliament, which were also referred to that committee, both seeking in the ordinary old-fashioned way to get additional capital to carry on their business. Mr. Cardwell, who presided on the committee of 1867, took a particular interest in the question, and seemed to have been desirous of regulating the whole of the metropolitan gas companies according to his own particular view of what gas companies should be and should do. In the course of the proceedings a great deal of discussion took place between the Government and the committee and the companies before them, the result being that the Metropolis Gas Bill, as they amended it (a general bill), was reported by the committee, but never went into the House of Lords. The companies were anxious to meet them in that House, but the opportunity was denied them. The terms of the Metropolis Gas Bill were proposed each by the Chartered and the Imperial Companies in their private bills, but they were rejected by both, and the bills were withdrawn, and both companies had to go without further capital in consequence of that view of Mr. Cardwell's committee. That led up to the last legislation —that of 1868. [The learned counsel here quoted passages from Mr. Cardwell's report, which have been previously given in the JOURNAL.] The report concluded—"Unless the companies are prepared during the recess to consent to such an arrangement, your committee think that every facility should be afforded to the local authorities of the metropolis in the session of 1868 for the introduction of an independent supply." That was intimating what, in the opinion of Mr. Cardwell's committee, was the right way to coerce bodies who had obtained distinct rights from Parliament, on the basis of which they had extended their capital. Mr. Cardwell admitted that there had been no compulsory legislation against them, and that no other company could be brought into competition with them, and that the mode of dealing with them was to coerce them by means of public rates, by enabling public bodies to come in to compete with the private companies, thus, of course, ruining them, because the private companies had a private capital embarked, and the public or the corporation of London, or the Metropolitan Board, would have had the unfailing fund of the public rates to fall back upon, and they must in the end have placed all the different bodies in competition. Such a thing had never been sanctioned by Parliament, and he did not think it was ever intended by Mr. Cardwell's committee as a reality, but it suggested to the metropolitan public bodies that it was the card for them to play, and in 1868 the corporation of London acted upon the hint, and introduced a bill to supply gas in competition with the private companies then supplying the City. He (the learned counsel) did not believe, if that bill had passed in the House of Commons, that it would have survived a day in the Upper House; but there was one company among the opponents (the Chartered) who wanted nerve, and who required money to construct new works at Barking, so they severed themselves from the other companies and submitted. That once being done, it followed almost of necessity that the other City companies should come under the same terms, and accordingly the companies supplying the City of London—viz., the Chartered, City, and Central Companies —all submitted, and instead of a Corporation of London Bill, there was passed, by reason of the threat of that bill, the City Gas Act of 1868. The Chartered supplied Westminster as well as the City, and were also subject as a public body, under the City Gas Act, to the Metropolitan Board of Works, who were petitioners against the present Imperial Bill. The constant object, as was evinced this session in Parliament, was to have that City Gas Act treated as a model Act, and binding in certain circumstances upon all committees of Parliament hereafter; in other words, that what a private but substantially the same committee in two subsequent years did, the House of Commons adopted through an individual member—an eminent one, but perhaps no particular authority on the subject of gas—that that which was so passed, and was adopted by the companies out of fear and under compulsion of necessity, was to be treated as a model bill, and everything which deviated or fell short of it was to be treated as an infraction of the general principle of Parliament. In the House of Lords that question was never considered in 1868, for the bill was fought out in the other House, and when it was first brought forward and discussed in the former, the other companies leaving their misguided brethren, as they were thought, to carry out in peace the arrangements they had been forced to make, but which, of course, appeared a voluntary arrangement when they passed from the scene of conflict and came before the House of Lords, who had never considered the bill, and were not bound by it in any degree; and even if they had considered it, the subject had never been discussed in their lordships House yet upon the basis of Mr. Cardwell's report. He (the learned counsel) had gone into those particulars because it was upon the question of the arrangement of 1868, adopted by those two or three companies under pressure, that most of the opposition to the present bill turned. He would now tell their lordships what passed as to the Imperial Bill elsewhere. It was committed in the House of Commons, and it was then opposed by the Metropolitan Board of Works, who, thinking that the House of Commons at least had a right to assume that the views of Mr. Cardwell's committee would be readily accepted, simply stated that their object in opposing the bill was to have it assimilated with the City of London Gas Act of the previous year, that it had been fully considered, and they did not think it necessary to call any further evidence. The committee did, however, proceed to consider the bill; they came to certain resolutions about it; and they gave the whole of the capital desired at 7 per cent. The bill was passed without trouble; but, when it was brought into the Commons for report, numerous clauses were moved by two independent members. Many of them were not very material, and the bill was remitted to the same committee, with the addition of Mr. Locke and Mr. Cawley, who were supposed to represent respectively the interests of the consumers and the companies. The Metropolitan Board fought nearly every clause in the bill, but the end of it was that it was passed, not strictly on the model of the City of London Act, but containing many of its provisions. In that City of London Act there were provisions authorizing the companies, with the consent of the Board of Trade, to amalgamate: those were the three companies close together. This was not in the Imperial Bill. They objected distinctly to any clauses being founded upon the supposed power to diminish expenses by amalgamation, seeing that they represented 25 square miles of the metropolis. They supplied one-fifth of that area now, and it was idle to suppose that their company should form part of a general amalgamation. The concern was so large, and its management so careful, that no amalgamation could improve it in efficiency or economy. They were in a ring fence. In the next place, by the City Act the gas supplied (except cannel gas) must be not less than 14 candles. The Imperial differed, inasmuch as they took 16, which was a concession of two beyond the Act of 1860, and reduced their price, which was 4s. 6d. under the Act of 1860, to 4s., which they had actually charged until the 1st of January, 1870. The maximum sought to be charged as up to January, 1870, when 14-candle gas was to come in, was to be 4s., instead of 4s. 6d., which was the price at that moment. After the 1st of January the price was to be reduced to 3s. 9d. The difference between this bill and the City Gas Act, 1868, was that after the same date they were to supply 16 candles at 3s. 9d. The Imperial were satisfied; they could not supply gas of a higher illuminating power and at a lower price, with fairness to their shareholders. That had been treated, even by Mr. Cardwell's committee, as an experiment, for they had a power which the company had also in this bill, to have the matter reconsidered. In reference to the cannel gas, the bill provided that after January 1, 1870, the maximum price should be 5s. 6d. per 1000 feet. (That was a reduction of 6d. immediately upon the Act of 1860.) The Act provided that the maximum price should be proportional to the price of 3s. 9d. per 1000 feet for 14-candle gas. That did not fix any absolute standard for cannel gas, but made the rate in proportion to the illuminating power over common gas. The Imperial Company supplied no cannel gas. The Western supplied nothing but cannel, but that was not under the present bill. The price to be charged for cannel gas was to be in proportion to its illuminating power. It was not a practical question. Then the following principle was laid down both by Mr. Cardwell's committee and the City Gas Act, 1868—that after the year's trial of the 14-candle gas at 3s. 9d., or any subsequent year, if application was made to the Board of Trade, by the company or by the Metropolitan Board, for a revision of the scale of illuminating power and price, the Board of Trade should appoint two competent persons to be commissioners for that purpose, who should, within ten days after hearing the company and the Metropolitan Board, fix an illuminating power and price for the company, to take place from the 1st of January in the year of revision, and such hearing should take place in February. That clause was the same as that in the City Gas Act, except that the Imperial had the addition that this hearing was to take place in February. That was disputed in the petition before their lordships, and if he went into clauses now it was to save them a great deal of time hereafter, because he supposed his friend would not contend that they were there against the preamble.

Mr. RODWELL: No; I think not. I think it is not important whether we are or not; but if you ask me, I say certainly not.

Mr. HOPE SCOTT said the principle of the clause last referred to was that there should be a revision both of price and illuminating power, and the result of that might be either the raising or lowering of one or the other. It showed that the actual fixing of the price and illuminating power was not treated as fuel. It was subject to revision, and in that revision he wished to secure that the hearing which was to take place should be early in the year, so that the quarter's payment might be charged according to the revised rate. That was objected to by the Metropolitan Board, who say it cannot be done in February. His answer was that, with a little pressure, there would be no difficulty in getting it done, and it was ascertained that before the consumers got fully into the new quarter, the company would be able to supply the price, and make out the new bills accordingly. For the guidance of the commissioners there were rules to the effect that they should fix such an illuminating power and price as would yield the company, with due care and management, the dividend they were entitled to under the Act, and to make up their reserve and contingency funds; also that they should not fix an illuminating power lower or a price higher than the maximum prescribed in the Act of 1860. Their lordships would bear in mind the company were entitled to earn 7 per cent. on their new capital, but which, as regarded the new capital of the Chartered Company, obtained last year from Parliament, would be 10 per cent. That was a distinction not sufficiently borne in mind by his opponents. The Chartered Company, when they submitted last year to regulations which they themselves thought they could not fulfil, retained their 10 per cent. as applicable to all their new capital, which was very large. The Imperial came, submitting to the same mode of varying the price and illu-

minating power, but the direction to the arbitrator, as regarded the whole of the new capital, meant practically, "See that the price and illuminating power shall work out as that, upon the very large capital of nine hundred and odd thousand pounds which we are now seeking to raise, and upon the previous £350,000—in other words, upon £1,300,000, or one-half of the share capital of the company—it shall earn 7 instead of 10 per cent., the 10 per cent. being allowed in the Gas Act of 1868 for the City companies." Under the General Gas Act of 1847, the company had power to lay by 10 per cent. upon their whole capital for a reserve-fund, and besides that had a contingency-fund. The Act of 1868 dealt with companies who had no reserve-fund at all, and all that it allowed them to lay by was 1 per cent. per annum until they should reach 5 per cent. on their whole capital. They called it an insurance-fund, and it was to be applicable only in cases of accident and things beyond the control of the company. The Imperial had £50,000 as their reserve-fund laid by at the commencement of the previous year, besides a contingency-fund. That contingency-fund was always introduced by Parliament to meet those very contingencies for which provision was made, under the City Gas Act, out of that 5 per cent. of the capital, which was the insurance-fund thereby sanctioned. The company proposed to maintain their power of keeping the reserve-fund and also a contingent-fund. Supposing the interest on the contingency-fund amounted to something very much more considerable than it would, probably then it would be £2400 a year; but supposing it was £50,000 a year, the company could get just the same dividend, and what was over, after they had taken their dividend, would go to the reduction of the price of gas. They could not get more than the dividend fixed by Parliament—10 per cent. on the old stock, and 7 per cent. on the new; but all those operations were, no doubt, very beneficial to the shareholders, because the contingency-fund would relieve them in case of accident—such as the bursting of a gasholder or the burning down of the Alhambra—and the expense which might happen from that of course the company must make good. And if it had an accident-fund, it helped to maintain the stability of the dividend, but it did not increase the amount. Section 19 stated that the reserve-fund of the company should never exceed £1250. According to the Act of 1847, they would have been entitled to lay by a fund equal to 10 per cent. upon all the capital sanctioned up to the present day; and next to have laid by under the powers, if their lordships thought fit to give them, of the additional £975,000, a further amount of 10 per cent. upon that sum, which would have made their total reserve £260,000. However, the company did not press that, and have no indisposition to yield to the directions of the committee embodied in the bill, that the reserve-fund should never exceed £81,250, which, instead of being a tenth, was a twentieth of the actual raised capital, without any power of laying by a reserve-fund in proportion to the new capital which they sought at their lordships hands. In the event of there being a deficiency of dividend under the said Gas Act, they would go to the commissioners and desire to have the rates altered, in order that they might gain that amount in a subsequent year; and the commissioners would be bound to adjust the rates at the commencement of each successive year, so that what had been wanting in the previous year should be made up in the subsequent years. By the possession of a reserve-fund, the public would not be subject to those violent fluctuations, and the company would be able to do what they had constantly done—viz., make speculative changes in their prices, and reduce them, having in their reserve-fund a guarantee that the immediate shareholders should not lose. That experiment might be fairly tried; they have done it once on that footing. They have, since 1860, reduced their price 6d. per 1000 feet. That means £60,000 a year, and 1d. per cubic foot is equal to £10,000 a year. They made that reduction because they knew that they had their reserve-fund behind; and the deficiency which, in fact, had occurred in the first reduction they were able to meet out of that reserve-fund, and, from the increased consumption and from other causes, it was brought up to be a remunerative rate. The fluctuation attendant upon the loss of reserve-fund would cause great irritation among consumers. He believed their lordships would see that the Act of 1868 was wrong. Upon the bringing up of the report upon the recommitted bill, the company again found some one in the House opposing it; and, luckily, they were at that time able to make the concession wished, and they adopted the clause. It illustrated the way in which popular opinion acted upon companies like the present. The frauds of Mr. Higgs had just come before Parliament. That suggested to an honourable member of the House of Commons clause 15 of the re-committed bill, providing that in case of any loss arising from fraud by any of the company's servants, caused from want of due diligence on the part of the directors, such loss should be deducted from the dividends. The Imperial had no objection to that, believing that the management of their company could hardly be assailed by such means as those of Mr. Higgs. On the third reading of the bill they had another attack made upon them, to put in a clause about vindicating the expediency of amalgamation, and making amalgamation one of the things to be considered in the revision of price, as an element which perhaps might be a possible ground for imputing want of economy to them. That, however, the House of Commons threw out; and they at last reached the House of Lords, where another incident occurred. The Chartered Company presented a petition for a bill to be relieved from some of the engagements which they had come under by adopting, unwillingly as they said, Mr. Cardwell's arrangement in 1868. They prayed for leave to introduce a bill to delay the period of the commencement of the 16-candle gas and 3s. 9d. price until they had constructed the works at Barking, for which power was given last year. He (the learned counsel) was told their last dividend was 4½ per cent., they having a right to provide 10, and at one period they had provided that amount. The Metropolitan Board, in their petition against the application of the Chartered Company, referred to a report just presented to Parliament by the referees appointed under the City of London Gas Act, 1868, in which it was stated that the adoption of good burners was all that was required to ensure a satisfactory amount of illumination, even at the 16-candle average, the illuminating power fixed for the City of London from the 1st day of the next January. The result was that the Chartered Company was left to ruin, which they said might ensue. Ruin meant, at least, no dividend under the obligations in which they were placed. So much for them. The illuminating power was formerly ascertained by the use of an Argand burner, and quantities were determined by the power of the gas as emitted or burnt from that burner. The City Gas Act had a clause identical with one in the present bill, stating that the referees who were to determine the illuminating power with reference to the quantities as specified by the Act should prescribe such a burner as would be most suitable for obtaining the greatest amount of light, and be practicable for use by the consumer. Many speculations had been ventured upon, and experiments made, with reference to the best mode of getting light out of gas, and the referees under the Act of 1868 seemed to have busied themselves with that subject. In their report (which only came out this month, and that accounted for its not being noticed in the petitions against the bill) they stated that the standard burner adopted under the Metropolis Gas Act had been known as the "Sugg-Letheby burner." Taking this burner as the standard, the referees, on testing by the photometer the large number of burners which they collected, found that the diversity as to illuminating power was surprisingly great. They also found that the kinds of burners in common use were extremely defective, entailing upon the public a heavy pecuniary loss, as well as other disadvantages. He (the learned counsel) thought it was fair, on behalf of many gas companies who had been charged with insufficient light, to show how much depended on the use of the burner. The result arrived at by this new kind of burner was that it showed a light as of 116 compared to 100 produced by other burners. The way in which that affected the question was, it would make 14-candle gas appear 16, and it would make 12-candle appear to be 14. Therefore, it was said the standard of 14 and even 16 was illusory, because burnt in a particular manner that gas would be always about 2 candles below the amount represented by the burner—*ergo*, the standard must be raised because a means has been found of burning the gas more effectually. That was the argument to be used, he apprehended, as it was intended to be worked out in the petition of the Metropolitan Board against that of the Chartered Gas Company. He pointed it out thus to guard their lordships against what had been an endeavour to be made a snare to the company. What they proposed with regard to illuminating power, and what was very fully considered in the House of Commons, was 14-candle gas. If that gas were tested by this particular burner, under section 57 of the bill, it would be shown that the company were giving 16 instead of 14 candle; 14-candle was fixed only for one year, and in 1871 there might be an application made, under section 25, for a revision of illuminating power and price, leaving only one year during which such a state of things could occur as was suggested. It was no use going and using a burner in a laboratory which would give particular results, but it must be a burner which could be used by consumers all through the metropolis if they chose to use a proper kind of burner. It was suggested that particular arrangements might render it available for common use, but the whole thing was up to that moment so experimental, that to legislate upon the basis of that or any other test burner would be in fact to build upon sand. It was utterly impossible to say what future years of invention might produce. In reference to the petitions, there were three presented against the bill; and in looking over the first, to which only nine signatures were attached, it really appeared that none of the petitioners were consumers of the Imperial Company's gas. He had looked through the company's books, and could not find the petitioners names as consumers. But even if it was a petition of consumers, he attached no importance to it, since they formed such a minority of the whole, and would be represented in any case by the Metropolitan Board of Works, whose constituents they were. He would now go on to the petition of the parish of Paddington, which prayed that the bill might pass without alteration, and he should mention that the parishes of Marylebone and St. Pancras, who appeared against the company before, no longer did so. The vestries of Hackney and Islington, which maintained a considerable amount of independence as to the Metropolitan Board, were also in their favour. The struggle in the other House was between St. Pancras and the Metropolitan Board.

Mr. RODWELL: Only on one point.

Mr. HOPE SCOTT then referred to the petition of the Metropolitan Board of Works, in which it was submitted that the bill was insufficient to meet the requirements of the consumers, as it departed essentially from the provisions of the City of London Gas Act, 1868. Clause 7 of the petition stated that the district supplied by the Chartered Company, being in different parts of the metropolis, and supplying an area to a great extent covered with buildings, was less adapted for supplying gas at a low price and a high illuminating power than the district of the Imperial, which extended over some of the wealthiest parts of the metropolis, and comprised large districts where building operations were being extensively carried on, and consequently the consumption was rapidly increasing every year. He would give their lordships a few figures with reference to that. The Imperial Company's district had 25 miles of area; the Chartered had 4 square miles of area, at a rental of £61,000 per square mile per annum. The rental per square mile in the Imperial Company's district was £29,000 per annum, and yet the Metropolitan Board was induced to say that the concentrated district of the Chartered was less favourable to that company, as a commercial company, than the district of the Imperial was to it. It was the concentration of the demand and supply which made the working of a company cheap. It was also maintained by the City of London, above all others, that the City ought to have exceptionally low prices, because there was no consumption, within so small an area, to be found in any other part of either the metropolis or the whole kingdom. The petition further submitted that an insurance-fund, similar to that provided by section 26 of the City Gas Act, 1868, ought to be substituted for the reserve-fund mentioned in section 18 of the bill. That was puzzling, because section 18 did not refer to a reserve, but a contingency fund.

Mr. RODWELL: It is a misprint; it should be section 19.

Mr. HOPE SCOTT: But my learned friend will find himself in this dilemma: he has not objected to both sections 18 and 19. At any rate, he has not objected to both the contingent and reserve funds, and now he must make his election which he will take.

Mr. RODWELL: Then take section 19, if you please; it raises the whole question.

Mr. HOPE SCOTT said he would not go into details of that kind. He knew what they meant, not from the petition, but from previous opposition. The petition meant in reality that the company should have no contingent or reserve fund as was in the bill, but should go into a new principle of that famous Act of 1868, which was the very model of all legislative wisdom. They should be allowed to lie only for the purpose of meeting accidents, but should have nothing to pay their back dividend of 5 per cent. on their capital. The board then made an objection which related to their own special prerogative as guardians of sewers. They submitted that, as the construction and maintenance of the main sewers were vested by Act of Parliament in their hands, they should not be altered or interfered with in any way except under their own supervision. Now, considering that the company were constantly at war with the Metropolitan Board, and they would not let the company go a step without throwing a clause of some fettering kind around them, it was but reasonable that, in a question affecting the public in the shape of gas consumers, as well as the public, who were dependent for cleanliness upon the Metropolitan Board of Works, with reference to the sewers, that they should be dealt with by some one to decide between them, and that was a person to be appointed by the Home Office. The petition also stated that the further amount of capital which the company proposed to raise was far too great, and under the vague and general powers of the bill it might be issued at a discount.

It was not likely the company would do so, and he did not know what the terms were, but it was certain that, if they were obliged year by year to meet the growing demands of the metropolis under penalties, they must year by year get money, and, if they could not get it at par, they would have to get it at discount, but they would never do so if they could help it. The petition further submitted that it was not expedient to confer upon the company any powers beyond those absolutely necessary to enable them to fulfil their obligations as to lighting their district with gas, and therefore it was not expedient to grant many of the powers sought for under the present bill. They did not say they objected to the site, nor even did they seem to say they objected to the capital. They said in the previous clause that the capital was far too great, but that was a matter of evidence. They further said it was very important, having regard to future legislation, that the Act relating to gas companies should be assimilated as far as possible. In short, the burthen of their song was this—"We, through Mr. Cardwell's committee, got a particular bill framed: do us the kindness to make that bill your model every year that comes before you, though you have never had to consider that bill or its provisions, and without much considering whether it is just or not." That was, they said, particularly valuable to them, having reference to future legislation; because every additional bill which they could produce, founded upon that very favourite model, afforded them strength, and in the end, they would succeed by that kind course which they began in the House of Commons, by simply laying that Act upon the table, and telling the committee to be good enough to compare the bill and the Act, and whenever they found they differed from the Act they would say at once that they ought to strike that out, or alter whatever was required. That special mode of proceeding, which he conceived to be an insult to the intelligence of any committee that sat on the subject, was an insult to their lordships, who had never had before them this Act, and were never parties to passing it; to whom, therefore, the whole Act was new, and who, he was sure, would do justice to it upon the reason and the fact of the case, and not upon an arbitrary precedent, which was adopted and admitted by two or three companies from their sheer necessities.

J. St. George Burke, Esq., examined by Mr. RICHARDS.

I have been for upwards of 20 years a director, and was at one time the governor of the company. I am familiar with its affairs for many years past. [The witness was examined at some length as to the history of the company, and in reference to the necessity for further capital, and the causes which led to the failure of recent applications to Parliament for power to acquire land and erect additional works.] In 1866, on the second rejection of the company's bill, they went before the chairman of the Standing Orders Committee, and obtained permission to raise £325,000 with the usual borrowing powers. They now come and ask for the difference between that sum and the amount asked for in their bill of 1865—viz., £975,000.

Mr. RICHARDS inquired whether the Board of Works raised any question about the additional capital required.

The CHAIRMAN said the committee could not conceive what the Metropolitan Board had to do with the capital of the company.

Mr. CRIPPS said the board did not object to the amount of money proposed to be raised.

Examination continued: The capital of the company, which up to 1854 was £1,300,000, had been in 1864 entirely absorbed. I think the £975,000 now asked for is a reasonable and proper sum.

The CHAIRMAN said it was not necessary to go further into the question.

Examination continued: I remember the introduction of the Great Central Gas Company into London. It was fostered by the corporation, who gave them permission to lay down pipes in the City without an Act of Parliament. When the Metropolis Gas Act of 1860 enabled the Great Central Company to raise their price from 4s. to 4s. 6d., the corporation became indignant with their own offspring. The question of the right of the company to increase their price was raised at law, and decided in their favour. The corporation have been very bitter against the company ever since, and have instigated a large proportion of the agitation which has since existed against all the companies. In order to avenge themselves, the corporation promoted a bill to enable them to compete with the City companies in the supply of gas. The bill was referred to a select committee, over which Sir John Trollope presided, and instructions were given to the committee to inquire into the operation of the Metropolis Gas Act. Thereupon the corporation invited all the vestries in London to aid them in their attack upon the gas companies. A long inquiry took place before the committee, and the companies stated that they were willing to supply 14-candle gas at 4s., and to submit the purity of their gas to a scientific tribunal. Upon that concession being made, the chairman stopped further inquiry, and the committee unanimously rejected the bill of the corporation without calling upon the companies for a reply. That committee expressed a strong opinion in favour of a regulated monopoly. After accepting our terms of 14-candle gas at 4s., the committee made a report, in which, without alluding to this offer, they simply stated that the illuminating power, as prescribed by the Act of 1860, ought to be increased, and the price reduced. They, therefore, left the question open to all the subsequent agitation which has taken place. Subsequently the corporation called in aid the Metropolitan Board of Works, and appealed to the Government to take up the question, and bring in a bill to enable them to buy up the interests of the companies by paying them 6 per cent. annuities in lieu of the 10 per cent. dividends they were enjoying. The Government would not listen to those terms, but they did bring in a bill for amending the Metropolis Gas Act, to which we organized a strong opposition, which would have been fatal to it had not the President of the Board of Trade promised that, if the bill were allowed to go to a second reading, it should not pass in any shape that would jeopardize our dividends. The bill was thereupon read a second time, and referred to a committee, of which Mr. Cardwell was the chairman. That committee made a report, in which they stated that the Act of 1860 had been too favourable to the companies, and they concealed the fact that the companies under the operation of that Act had reduced their charge £300,000. It then went on to say that we ought to give 16-candle gas for 3s. 9d. per 1000 feet, which was a price and illuminating power that would have been tantamount to our ruin. And then it went on to say, "Although we cannot, in justice, according to parliamentary usage, compel you to adopt these terms, yet, if you do not accept them, we will recommend to Parliament a means of ruining you by competition." The corporation took the hint, and in 1868 brought in a bill, which was referred, with other metropolitan gas bills, to practically the same committee as sat the year before, and they, without going into the case over again, said they should adhere to what they had stated in their report. The Chartered Company being threatened with competition by the corporation had no alternative but to accept the terms of the committee, although, as their chairman stated, they knew it would entail ruin upon them, at least for some years to come. Subsequent events have justified that statement. Formerly they paid 10 per cent.; when they got financially worse off by reason of the condition of their works, they paid 7½ per cent.; and since the passing of the Act of last session, although they have not fully come under its provisions, they have paid only 4¼ per cent. There is an arbitration provided by the Act, under which, when its operation has been tested for one year, the price of gas may be increased. I am told that they have petitioned Parliament for a postponement of the time when the Act shall come fully into operation from 1870 to 1871. I should say that we unquestionably would have accepted the terms of Mr. Cardwell at once if we had not seen plainly and distinctly that we could not do so without comparative ruin to our shareholders. Our present bill, as we brought it in, was consistent with the promise we made to Sir John Trollope's committee, and which was accepted by them—viz., 4s. for 14-candle gas. The committee of the House of Commons this session accepted the illuminating power, but declared that, after the end of this year, we should reduce our price to 3s. 9d. We did not concede this voluntarily, because it will reduce our revenue by £30,000 a year; but, at the same time, we thought we would do our best to struggle against it, our necessity driving us to have additional capital and additional works; but no doubt we shall have a difficulty in paying our dividends as the bill stands. Since we reduced our charge from 4s. 6d. to 4s., which was a reduction to the public of £50,000 a year, we have never been able to maintain in any one year our maximum dividend, but have had constantly to supplement our profits out of the reserve-fund. If next year we reduce the price to the extent of 3d. per 1000 feet, which will be £30,000 a year, we shall be at that time unable to make up our dividends. If, in addition to that, we should be required to increase the illuminating power to 16 candles—each additional candle being defined by the City Gas Act as costing 2½d.—the effect would be to reduce our income by £80,000 a year, which we could not submit to. We require from £140,000 to £150,000 to pay our dividend of 10 per cent.; so that, if this £80,000 were taken off, we should have £60,000 applicable to dividend. We should also have to forego any reserve-fund. We should not have accepted 14-candle gas at 3s. 9d., but that we have a reserve-fund of between £30,000 and £40,000, out of which we can still maintain our dividend for a year or two, till the consumption arising from the reduction of price increases. Neither of the companies affected by the Act of last session have any reserve-fund. Without a reserve-fund we could never have made the reductions we have made to the public; but, having that fund in hand, by which the dividends can be equalized, the public have had the advantage of reductions long before the company could be recouped their entire dividend out of revenue. I have not a doubt that the plan contained in our bill is much more beneficial to the consumer than the plan of an insurance-fund. I do not think anything would be gained to the company by the proposed amalgamation. The committee who recommended it only recommended such an amalgamation as would reduce the number of companies in London to four; and we, practically, supply an area equal to a fourth of the metropolis, or nearly so.

The CHAIRMAN stated that the committee did not at all feel inclined to consider the question of amalgamation.

Examination continued: If the standard of illuminating power is raised, it is necessary to add largely to the quantity of cannel employed. In 1867 we were prepared with a large amount of evidence to show the limited area of the cannel coal-field, and the inevitable result which would ensue if the companies were compelled to give cannel coal gas in London—that we should be entirely at the mercy of the cannel coalowners; but we were not allowed to give that evidence. I am told that on the passing of the Act of last session the price of cannel did rise. The committee of 1860 came to the conclusion that the illuminating power of gas in London ought to be such as could be afforded by the Newcastle coal-field. We can only give 14-candle gas by an admixture of cannel, and if we go to 16-candle gas, the cost of manufacture would be largely increased. Dr. Letheby, before Sir John Trollope's committee, stated that a 4s. price for 14-candle gas was a fair thing for London. I believe the site selected for our new works is the best that can be obtained. We originally selected a site near Victoria Park, but we were driven from that; and in erecting works at Abbey Marsh, we must expend a larger sum of money in reaching our district by large mains. It is not a fact, as stated in the petition of the Metropolitan Board, that our district is more favourably situated for supplying gas cheaply than that of the Chartered Company. I suppose they put that in their petition at the instance of one of their witnesses in the House of Commons. The rental per square mile of the Chartered Company is £254,927; of the City Company, £106,388; and of the Great Central, £78,049; making £439,364. The number of miles of mains of the three companies is—Chartered, 161; City, 53; Great Central, 61: total, 275. The area of the City proper is a trifle over a square mile, the gas-rental upwards of £230,000. The area of the districts of the three companies united, and including the City, is about four square miles, which gives an average rental per square mile of £109,347. The area of the Imperial Company's district is about 25 square miles, and their rental £531,759, which gives an average per square mile of £29,270. The Chartered Company last year came under an obligation to supply 16-candle gas, and the Act allows them to divide 10 per cent. upon the whole of their capital. If at the price limited in the Act they cannot pay 10 per cent., the commissioners can give them such a price as will enable them to do it; so that, if justice is done to the company, the public must eventually pay the 10 per cent. We are raising £1,300,000 at 7 per cent.; if we took the same terms as the Chartered Company, it would make a difference to the public of £30,000 a year.

By the COMMITTEE: In the House of Commons an honourable member asked me if I would consent to do this, and my answer was, "We do not care so much about the 7 or the 10 per cent. dividend, as that at such a price and at such an illuminating power we can be sure of maintaining the dividend sanctioned by Parliament." We are quite sure that with 16-candle gas we cannot maintain 10 per cent. dividend, and therefore we should be put to all the expense of going before the commissioners to determine *de anno in annum* what we are to charge.

Cross-examined by Mr. CRIPPS: The system which we have adopted by this bill, as to the investigation of the affairs of the company, is practically the same as has been adopted by the City. The circumstances under which the companies supply different parts of London are so different that you cannot have a uniform system of price.

Mr. CRIPPS: The real substantial question between you and the present opponents of the bill is whether Mr. Cardwell's report shall be carried out in legislation for the Imperial Company, or whether the legislation for that company shall be an exception from Mr. Cardwell's report?

Witness: It amounts to this—whether the bill shall be rejected or not because we cannot accept Mr. Cardwell's report.

Mr. CRIPPS: But that is the substantial question between us, is it not?

Witness: The question between our opponents and us is whether we shall

submit to terms which we say are not only inconsistent with the contract upon which our capital has been subscribed, but inconsistent with the maintenance of our dividends hereafter.

Mr. CRIPPS: That is another way of putting it; but it comes to this—whether Mr. Cardwell's report can be applied to the Imperial Company or not.

Witness: You know your own case, and if that is your case you know it. If you want to force upon us Mr. Cardwell's report, I tell you candidly we will not accept it.

The CHAIRMAN: The committee feel that they are not bound by Mr. Cardwell's report.

Cross-examination continued: Mr. Cardwell's report, as far as the legislation of 1868 is concerned, has been applied to three of the metropolitan companies, and one of them has sought to get out of its obligations by introducing a bill this session for the purpose. The companies accepted the terms under the circumstances stated by Mr. Hope Scott. The Chartered Company was the only one I looked to as being primarily affected; but I should be surprised to hear that the other two companies had since divided 10 per cent. We were represented before Sir John Trollope's committee in 1867, but we gave no evidence, the chairman stating that he thought we might safely leave the case in their hands. I do not think the report of that committee so unfair as the report of Mr. Cardwell's. I think the misfortune of that report is as I said, that instead of stating what concessions we were prepared to make, they left it an open question, merely expressing their opinion that the illuminating power should be increased, the price reduced, and an investigation made as to the purity of the gas supplied. Prior to the Act of 1860 there was no legislation to prevent competition in our district; but, as we were entitled to 10 per cent., we did not fear it. The Act of 1860 secured us our districts free from competition, upon the performance of certain obligations in the interests of the companies. Under that Act no charge has ever been brought or can be brought against us of malfeasance with regard to its provisions. I believe that, by reason of the great economy rendered possible by that Act, some of the companies who had not done so before paid 10 per cent.; and, that being a condition precedent to the reduction of price, they then reduced their charge to the public. Until 1854 there was no restriction upon us as to the amount of our dividend. We had then the power to light the same district that we have now. Our capital previously was £650,000; after that it was doubled, and we are now seeking to double it again. If we were a new company, we should ask 10 per cent. upon this capital, and be allowed to have it as usual. We do not claim any exemption from Parliament on account of our being an old company. We are raising a large sum of money, to enable us to fulfil our obligations to the public, and we offer to raise that many at 3 per cent. less than a new company would do it for.

By the COMMITTEE: The present bill was originally very much like the bill we introduced in 1866, with the alteration of site, but the House of Commons have added many clauses which we have accepted.

By Mr. CRIPPS: I believe the Chartered Company's district is pretty well filled up. Our district, unfortunately, will never be filled up in the ame way, because in a suburban district the houses are scattered. Ours district is enlarging, or we should not be here asking for more capital. I very much doubt whether we can look to a better future than can the Chartered Company; on the contrary, if I had my own will, I should be very glad to cut my district in half, and rest on my oars where I am; but, inasmuch as a large district is assigned to me, which Parliament says I must supply, I have to come here for money to do it. I should be glad to see another company take the duty, and then Parliament would have to give them 10 per cent. The increase of our business has enabled us to reduce our charge to the public, and that we have done voluntarily; and if our business goes on increasing in the same ratio we shall be obliged by law, if we can do it, to reduce our charge to the public still further, as long as we pay 10 per cent. We paid 10 per cent. before 1860, and have done so since, but we have had to supplement our profits out of the reserve-fund to pay it. I should think we have taken £40,000 or £50,000 in that way since our reduction of price to 4s. in 1865; and since, by reason of our bills being refused, we have been put to undue expense, and been obliged to alter our works in an inconsistent manner, in order to enable us to go on supplying gas at all, we have been put to charges which have been inconvenient to us and bad for the public too.

Mr. RICHARDS stated that the reserve-fund was resorted to for the purpose of making up the dividend in 1866 to the extent, in round numbers, of £7800; in 1867, to the extent of £7000; and in 1868, to the extent of £37,000.

Witness: If we had not done so, we could not have made any reduction in charge to the public, our dividends being reduced below that which, by contract with Parliament, we were entitled to receive.

The counsel and parties were directed to withdraw, and, on being again called in,

The CHAIRMAN said the committee were of opinion that the promoters had shown a very strong case indeed. They, of course, felt ready and willing to hear any evidence that might be given on the part of the opponents of the bill, but they felt bound to express themselves as strongly as they could that they considered the evidence as given by the promoters to be very conclusive upon the question, and that the cross-examination of Mr. Burke had not shaken his evidence in any one point.

Mr. RICHARDS said that, after that intimation from the committee, he did not propose to offer any more evidence, although he was prepared to produce the evidence of engineers, who would go into the minutest details with regard to the works, and every officer of the company, who were prepared to answer any question relatively, either as to the capacity or financial state of the company; and that he (Mr. Richards) challenged the fullest possible investigation.

Mr. RODWELL stated that, on behalf of the Metropolitan Board, he only proposed to go into the two questions of reserve-fund and illuminating power.

Serjeant SARGOOD said he proposed to call evidence on behalf of the petitioners for whom he appeared.

Mr. RICHARDS objected to the *locus standi* of the learned serjeant, on the ground that the petitioners for whom he appeared were not consumers of the Imperial Company's gas.

Serjeant SARGOOD was heard in support of his *locus standi*.

The CHAIRMAN said that, although the committee considered it mere waste of time to listen to any evidence or argument in support of that petition, they considered the learned serjeant had a *locus standi*.

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Mr. DENISON said it was not his intention to call any more witnesses on the preamble. It was not proved yet, and of course their lordships had to hear anything which the opponents might have to say against it. The learned counsel asked Mr. Rodwell if he appeared against the preamble.

Mr. RODWELL: No.

The CHAIRMAN (to Serjeant Sargood): Do you appear against the preamble?

Serjeant SARGOOD: I think we may say that we do not, except so far as this, that if we induced your lordships to make any alterations in the clauses, the preamble might have to be modified.

Mr. RODWELL then proceeded to address the committee. He said the Metropolitan Board of Works had considered very carefully the strong opinion which their lordships were kind enough to give them yesterday, with the view of saving time and trouble on the part of the promoters and opponents. If they wished for any evidence, he could call it; but he did not think, after what fell from their lordships yesterday, it would be a very hopeful proceeding on his part, and it certainly would discourage him very much from going into the general question of the bill.

Mr. DENISON: We had better consider, I think, first of all, whether the preamble of the bill is passed.

Mr. RODWELL: I do not oppose it at all.

Mr. DENISON asked their lordships to pass their usual vote in the regular way, and then to proceed with the bill. He thought his learned friend would agree that that was the regular way of proceeding.

Mr. RODWELL said there was no objection to that. The parties whom he represented had always taken the side of the consumers against all of the gas companies, when they had come forward to assert their rights. In this particular case the board had no doubt been instrumental in having the bill very much altered and modified from its original form. There were two points upon which he thought it due to their lordships that evidence should be submitted. In the House of Commons the board got certain modifications, but they did not get all they believed the consumers were entitled to. They founded their view upon the ground that they thought, when a similar bill was before a committee of the House of Commons, certain provisions were introduced into it with regard to reserve-fund, price, and illuminating power, which conditions the Imperial Company would not submit to or accept at the hands of that committee; and the board, on the part of the consumers, did not understand, unless some strong reason was shown, why one company should come to Parliament and have certain rights and powers conceded to them which had been denied to another company. Certain legislation had taken place with regard to the City companies, and they had accepted those terms; and he asked now to have cause shown why the Imperial Company, who came to Parliament, should not be put on the same terms. The board acted strictly for the consumers. He should be prepared to give evidence to show that there were no exceptionable circumstances which entitled the Imperial Gas Company to charge one penny per 1000 feet more than the City companies. He could also show that the legislation of Mr. Cardwell's committee had nothing whatever to do with the reduction of the dividend to which those companies had been reduced. He was prepared to show, with regard to the reserve-fund, that in the City gas companies they had no fund beyond that which provided for accident and any extraordinary emergency which might arise, and which could not be foreseen or guarded against by due care and management. As far as legislation had gone, the Metropolitan Board of Works were the recognized persons to protect the public, and to see that the gas companies acted up to the provisions and conditions of the Act; and he had it on parliamentary record that the Board of Works, in dealing with those companies outside the City, were to have the same rights, powers, and privileges as the corporation of London had within the City.

By the COMMITTEE: What is the date of that Act?

Mr. RODWELL said it was last year—1868. That being the case, it seemed only reasonable that, when companies came to Parliament, unless they could show some exceptional causes to serve a district without the City, the Imperial being a company who supplied without the City, he was at a loss to know why the board should not have the same rights, powers, and privileges, with regard to the consumers, in dealing with the Imperial Company, as Parliament had already given them with regard to those companies when they came within their district. That was the case which the board submitted to the House of Commons committee with considerable effect as far as the alteration in the original bill was concerned, and there were two points to which he wished to direct their lordships attention. Of course the whole principle was that those companies were almost all monopolies to begin with. London was districted out, and the object had always been, on the part of Parliament, to secure what had been called a well-regulated monopoly. Competition was at an end in various towns and boroughs in England; and if a gas company did not give accommodation to the customers, or was unsatisfactory, or fell short in any way, the consumers, to a certain extent, or the corporation had the power of starting a rival company, keeping the old company within certain bounds and under certain control. In the City of London it was different, because it would be a most gigantic undertaking, either for the Metropolitan Board or the corporation of London, to take upon themselves the whole supply of gas for their district. The district of the corporation could not be so extensive as that of the board; but in either case there would be a very large question involved, and therefore gas companies were not subject to competition, and to that sort of moral control in London that they were in the country. Therefore, it became more important to see that the monopoly was so conducted as not to be burdensome to the consumers. A passage in Mr. Cardwell's report said that the stimulus to due care and management would be unduly weakened if the companies were enabled to make good the deficiency of one year's dividend by the surplus of another. In the City Acts that power was prevented. In the present bill before their lordships, the Imperial Company had a contingency and also a reserve fund, and could pay their back dividends; therefore, if in any one year—take six years previously—they had a bad year, and their dividend was only 3 or 4 per cent., if that dividend six years afterwards was 15 per cent., they could take the whole of that to make up the deficiency of six years before. The consumers wanted to know why the shareholders should have the benefit and not themselves; therefore, notwithstanding Mr. Hope Scott's argument, which he (Mr. Rodwell) could never understand, it appeared to him that the consumer, dealing with a company like the City Gas Company, must be in a better position than if he dealt with the Imperial, because, under the Act, directly the former made 10 per cent., a reduction took place in the price of gas. In the Imperial Company they would say, "No; they wanted all their surplus over 10 per cent. to pay their back dividend for six years *pro tanto*." In clause 26, which the board said ought to be inserted, it provided that if the dividend exceed 10 per cent., the excess, to the amount of 1 per cent. per annum upon the paid-up capital of the company, should form an

insurance-fund to meet any extraordinary claim arising from accident which prudence could not have prevented. [The learned counsel also here quoted the 31st section of the General Act.] In the one case his learned friend might say that, although it did not appear upon the face of the bill, in any particular clause, that the Imperial had a right at the present moment to apply the surplus over 10 per cent. to answer a deficiency which might at any time happen in the amount of divisible profits, in the City companies they had no powers of a similar nature; all they were limited to was a power to have a certain reserved fund, which was used as a contingency-fund, and which also the Imperial had.

Mr. DENISON: Our two funds, or the reserved fund, amounts to exactly one-twentieth of the capital.

Mr. RODWELL: Yes; but it is the application of that reserved fund. In one case it is limited to accidents, and matters of that kind, and in the other it is to answer the deficiency which may arise in the profits.

Mr. DENISON said their lordships knew all about people getting clauses into Acts of Parliament; here was the very alteration which the board got into the House of Commons for themselves. The latter part of clause 19, relative to the contingency-fund, being applicable only to meet unpreventable accidents, he himself argued against them, and they had now got it in their bill, and having got it they wished to alter the clause altogether. Sir John Duckworth, in the course of the arguments, said he thought the plan introduced by the company was much better than Mr. Cardwell's for the public. This matter was agreed to in the House of Commons, and the board got what they asked for.

Mr. RODWELL said his friend did not represent the matter quite correctly; they were two distinct matters. Did he pretend to say that, because the board asked for certain things in the House of Commons, and were refused, they should be procluded from coming to ask them at the hands of their lordships?

Mr. DENISON said the modification of that clause which was given in the Commons was the result of that application.

Mr. RODWELL said no doubt it was, but they never accepted it. Surely, because they discussed a clause, they were not bound to submit to its provisions. He was perfectly right in his facts, though his friend might be technically right also. He was prepared to call evidence to show that the funds of the Imperial Company, the profits derived, the area over which their works were extended, and all the attending circumstances, did not warrant the Legislature in giving them an indulgence and a benefit against the consumers which the other companies did not enjoy. He maintained that consumers in one part of London ought to be in the same position as consumers in another part, as to the illuminating power; and, unless some strong reason was shown, when they were legislating for the whole metropolis, why one consumer should be subjected to an extra charge which he would not have to pay if he dealt with another company, he should say that those powers should not be granted. The object of this bill was to have one regulated monopoly, and he could not understand how it could be so if one monopolist could charge one price and another monopolist could charge another—the mere difference being the accident of residence, whether a consumer paid more or less for one of the now necessaries of life. If this was a case of water supply to the metropolis the same thing would occur, and it would be a strange thing if one company supplied water at the same cost, and made the same profit, that a person who lived on the other side of the road should pay more for that article. Gas and water were both equally necessaries of life, and he would submit that, if he could satisfy their lordships that there were no exceptional circumstances, there was no reason for departing from the resolutions and decision of that committee in dealing with the question. Mr. Hope Scott's able address to their lordships was followed up by the very powerful evidence of Mr. Burke, who was a very practised witness as he was a very practised advocate. He (the learned counsel) put himself, to a certain extent, in their lordships hands, after the intimation which they gave. Whatever their decision might be—whether they heard evidence or not—it would not be for him to complain.

The CHAIRMAN inquired if the Imperial district went beyond the boundary over which the Metropolitan Board had control.

Mr. DENISON said they had power to go far beyond.

Mr. RICHARDS: There is no boundary north. I believe we may go to York.

Mr. DENISON asked his lordship to allow him to take an objection, not to his learned friend's (Serjeant Sargood's) *locus standi*, but they had heard Mr. Rodwell say, two or three times over, "We are the guardians of the consumers," and there was an absolute written rule in the other House, that when people were represented by a body having a right to represent them, those people were not to be heard besides. He thought, if they would tell his learned friend, Serjeant Sargood, that, although he might technically have a *locus standi* from yesterday's proceedings, after what Mr. Rodwell had said that morning his *locus standi* was gathered up, so to speak, by the arms of Mr. Rodwell.

Serjeant SARGOOD said he thought he had a right to say, after their lordships had granted him an indulgence, notwithstanding his learned friend's adroitness, that his (the learned serjeant's) clients were in a very different position as consumers of gas. The Metropolitan Board were a body constituted by the vestries of the metropolis; in that sense they were the representatives strictly of the ratepayers, and the ratepayers as an aggregate body had an interest in the consumption of gas as regarded the public lamps. Their interests were in an inverse ratio to those of private consumers, and therefore it was clear they were not represented by the Metropolitan Board.

The CHAIRMAN: Mr. Rodwell, as I understand, represents the whole of the consumers of gas—that is 65,000—and you represent 9.

Serjeant SARGOOD: He represents properly the ratepayers.

Mr. RODWELL: Almost every ratepayer is a consumer.

Serjeant SARGOOD said it might just as well be said that he represented the consumers of bread, because every consumer ate bread; but he (Mr, Rodwell) represented ratepayers *quâ* ratepayers. It was an accident that they were consumers of gas, but he did not represent them as gas consumers any more in that sense than he did the consumers of bread or water. What Mr. Rodwell had said as to the two experiments of the Imperial Company which had been alluded to and quoted by the promoters, as though they came here armed with the sanction of both Houses of Parliament, they were experiments of theirs made in 1865 and 1866. The 1865 bill had been termed the Bishop of London's bill, and the 1866 bill was for Victoria Park, and they were both rejected. The committee of 1867 had profited by previous inquiries. It was quite clear that for many years Parliament had considered gas companies were trustees for the consumers. He said trustees advisedly. It was evident that the moment the company had obtained their maximum dividend they were *quasi* trustees for the public, to give them the advantage of anything that might be coming in beyond that. Starting with that idea, which he thought was as early as the Gas Clauses Act of 1847, the whole contest between the consumers and the companies from that time had been that the former might have justice done them; and he need hardly tell them how unfair a contest it had been with the amalgamated thirteen companies—the weight of their influence and purse on one side against the public on the other. The counsel here quoted and remarked upon the report of the committee of 1867, and proceeded to say he was perfectly sure one thing arrived at by that report was the discouragement of the enormous outlay which the Imperial were now proposing to make in order to get over the difficulty in manufacturing sufficient gas. The Chartered Bill of 1868 contained a clause expressly framed to meet that difficulty, by enabling them to sell gas in bulk to other companies; so that where the principle of amalgamation was not carried out by three or four companies being merged into one establishment, the avoidance of a needless outlay was met by the proposition that another company, who were able to manufacture largely, should have the power of selling in bulk to a third company who were consumers, but wanted more gas than they could make for themselves. One of the points involved was the discouragement of the enormous outlay of capital for the purpose of manufacturing gas, and that discouragement was intended to have the obvious effect on the consumer, that, inasmuch as that enormous outlay involved payment of dividend, all that was abstracted from profits to pay dividends, put at a more remote distance the chance of the consumer to get out of surplus of profit a reduction in price of gas. Those were the principal points on which the consumers desired to impress upon their lordships the importance of compelling each company, as it came for additional powers, to take up one uniform system, as laid down by that amended Act of 1868, by incorporating its provisions in their own bill, as the Chartered did under the 109th section of theirs. The absence of such uniformity had been before alluded to. If a man had two houses, he might be taking 14-candle gas from the Imperial at 3s. 9d., and 16-candle from another company at the same price. If the whole principle, after being well ventilated and discussed in 1868, ended in a statutable provision regarding the whole City, and so far outside as supplied by the Chartered, saying that 16-candle gas should be supplied at 3s. 9d., why were their lordships asked now to make an exception in favour of the Imperial Company to supply 14-candle gas at 3s. 9d.? Both Houses had passed the 1868 bill; both Houses had sanctioned the Chartered Bill, which adopted it; and, if their lordships now said that the Imperial might escape from the principles laid down in that report, they would have the anomaly of two companies coming to Parliament since 1868—since the Gas Act was passed—and each obtaining from Parliament, without the slightest distinction as to manufacture or so on, different principles, both with regard to the mode of management, and as to the price of gas. He was quite prepared to take any course which their lordships might think he ought to take, and would bow to any intimation of their lordships, thanking them for the opportunity afforded him for explaining those matters.

The counsel and parties were directed to withdraw, and, on being called in

The CHAIRMAN said: The committee are unanimously of opinion that it will be unnecessary to call any evidence.

The clauses of the bill were then proceeded with.

Upon clause 34,

Mr. CRIPPS had an amendment to propose. The clause stood as follows: "The commissioners shall within ten days after hearing the company and the Metropolitan Board of Works." He thought the limit of ten days would be very inconvenient, and that the commissioners could not within that time give a proper decision. He therefore proposed to substitute the words, "With all reasonable despatch, and in any case not later than the 1st day of June." Then the latter part of the clause ran: "That they shall fix an illuminating power and a price for the company, to take effect as on and from the 1st of January in the year of revision." That was thought inconvenient simply as having reference back; not so convenient as if the revised price was to take effect, say, from the following July, so that what the commissioners might do should not have a retrospective effect, but have effect from July, after the matter had taken place.

Mr. DENISON: And take care to leave us a bad half year always, so that we shall not have a dividend.

Mr. CRIPPS said not at all; the revision might be in favour of either the one or the other. "And such hearing," it said, "shall take place in the month of February." If that was struck out, and the words, "and in any case not later than the 1st day of June," put in, he thought it would be more convenient.

Mr. RICHARDS said the object in originally proposing this matter was that no unnecessary time should be occupied. They still thought that it gave ample time for the commissioners to decide the matter, and the company were then enabled to send out their bills on Lady Day, and they knew the price at which those bills were to be made out. When it was remembered that the company had 68,000 customers, they must suppose that those bills could not be done in a short time. The company had to go round and take the state of the meters first, and, if the accounts were to be sent out on the 25th of March, it was necessary they should know the fixed price beforehand. If the time was abused in arbitration, and delayed till June, and then if the alteration of price should take place as from the 1st of July next, the company might be left in the position of having a very bad price during that, the most valuable half year, which began in January, and ran through the spring months of February, March, and April. He would, of course, be told that it would cut both ways, but the operation would be that the Metropolitan Board would try to cut down the price of the company; that would be much more likely to be the case than that the company would raise it.

A MEMBER of the COMMITTEE: The Metropolitan Board are not the body that will have to do this.

Serjeant SARGOOD: The commissioners are the judges, and the board will be either plaintiff or defendant in the action.

After a lengthy discussion, in which various periods were suggested for the meeting of the commissioners, it was decided that the clause should stand as it was in the bill.

The clauses of the bill were then proceeded with, and passed.

HOUSE OF COMMONS.

(*Before Mr.* HEADLAM, *Chairman; Col.* DYOTT, *Mr.* JOHNSTON, *and Mr.* RYLANDS.)

KEIGHLEY WATER BILL.

THURSDAY, MAY 6.

Mr. CLERK, Q.C., and Mr. SARGOOD appeared for the promoters; and Mr. PRICE for millowners on the river Worth.

Mr. CLERK said the object of the bill was to authorize the Local Board of Health for the district of Keighley to make additional works, and to extend the limits for which they might supply gas and water. The local board were in possession of the existing works for the supply of water. The town of Keighley was situated in the valley of the Aire, at the junction of the river Worth. It was most advantageously placed for the rapid increase of manufactures, and consequently there had been a large increase in the population. The water supply had been lamentably deficient. The first power to supply water was taken by a private company in the year 1816, and at that time the population was not more than 6000 or 7000, the population at the present time being 20,000. The supply authorized in 1816 turned out to be insufficient, and they gradually—partly by legislative power and partly by arrangement—acquired additional springs. In 1856 the supply was 100,000 gallons per day, which, to the then population of 15,000, was about 6 gallons per head, including a considerable amount for manufactures. In the year 1865 the Board of Health agreed to purchase the works of the water-works company, and in 1867 they came to Parliament for a bill to sanction that purchase, and also for the purpose of authorizing the supply of an additional quantity of water. That bill met with a strong opposition from various parties, and the consequence was that the only powers granted were for the purpose of the existing works of the old company. In 1868 there was a severe contest between the corporation of Bradford and those who had an interest in the water flowing down the Worth Valley into the Aire, and the result was that the Bradford Corporation lost the powers which they then claimed to get possession of this water. Fortunately, this had come to an end, and this year an arrangement had been made, by which they would receive a portion of the water, and the remainder was left available for the rapidly increasing population of the district of Keighley. There was still, however, some claim for compensation on behalf of certain millowners on the Worth. The district in which the water was collected was chiefly moorland, and it would flow for six miles through an iron pipe into a high service reservoir, which was sufficiently high to supply the highest part of the the town. The high-level service was connected with the low-level service, so that when there was overplus of water in the high service it could be sent into the lower district. There was really no dispute as to the necessity of this increased supply, and the only question before the committee was as to the compensation that should be given to the millowners. The promoters proposed to give them the same compensation clauses as had been given in the preceding case—the Bradford Corporation Water-Works.* They gave them a compensation area and reservoir which they considered sufficient, but the millowners wanted in addition a specific guarantee as to the compensation which they should provide.

The CHAIRMAN: Where do you get your present supply of water?

Mr. CLERK: In the district of Keighley itself, but it is miserably short. The supply which we seek power to take in this bill is undoubtedly new.

The learned counsel then intimated that there were certain changes in the sections which, in accordance with the Standing Orders, it would be necessary to prove.

Mr. *Weatherhead*, examined by Mr. CLERK.

I am clerk to Mr. Burr, of Keighley. There are certain amended plans, and I have deposited them in Wakefield and Lancaster, and in the offices of the different parishes affected by this bill.

Mr. *Thomas Gibbs* also deposed that he had deposited the amended plans at the Private Bill Office.

Mr. *Brig*, examined by Mr. SARGOOD.

I am a worsted manufacturer and spinner at Keighley, and a member of the Local Board of Health. The parish is a large one, extending over 10,000 acres. The town is situated at the junction of the valley of the Worth with the Aire, and rises to a considerable extent. The local board last year had to borrow water from me. The town has increased considerably, and absolutely depends for a supply of water upon the Local Board of Health.

Mr. *G. Burr*, examined by Mr. SARGOOD.

I am an attorney, and clerk to the Local Board of Health. There is a great necessity for an additional supply of water. This bill has been brought forward with the approval of the ratepayers, who in two public meetings authorized the Local Board of Health to procure that additional supply.

Mr. *Styleman*, examined by Mr. SARGOOD.

I am a civil engineer, and have planned this scheme for supplying water to the town of Keighley. There are two levels—a high and low. I believe the works proposed can be carried out within the estimate given. It is the purest supply of water we can get, and almost as pure as Glasgow. I believe the corporation reservoirs are amply sufficient for the millowners. The present works can hardly be called works at all, and are quite insufficient.

Mr. *Milligan*, examined by Mr. SARGOOD.

I am a licentiate of the College of Surgeons, and a member of the Local Board of Health at Keighley, where I have been in practice for many years. In my judgment, as a medical man, it is necessary that the town of Keighley should have a larger supply of water both for domestic and manufacturing purposes. The present water is bad, and crusts the boilers. It is deficient in quantity as well as in quality. During the last summer the flow of water down the drains and becks was very much diminished. The consequence was that the filth was not carried off, but allowed to ferment in small pools, giving miasma, which injured the health of the people.

This concluded the case for the promoters.

Mr. PRICE said that he would now tell the committee the position in which he stood. The millowners, whom he represented, wanted in this case not merely a compensation area, but the guarantee of a specific quantity of water; but at the same time, having accepted a compensation area in the previous case, he did not know that they could effectually press their demand in this case. The bill provided a compensation area, and he did not know that they were in a position to ask for more.

In answer to a question from the chairman,

Mr. STYLEMAN stated that the compensation area in this case was based upon the same calculation as in the Bradford case.

The CHAIRMAN: We think that the same principle of compensation should be applied in both cases.

Mr. PRICE said that in that case he would withdraw his opposition to the bill.

The preamble was then declared proved, and the clauses having been gone through, the bill passed.

WE have much pleasure in recording that Mr. R. Clark, engineer of the Truro Gas-Works, has successfully passed an examination on inorganic chemistry at the Royal Cornwall Institution—a science to which he has given much practical attention in connexion with its application to gas products.

* The report of the proceedings on the Bradford Water Bill will appear in a future number.

Legal Intelligence.

DUNDEE GAS ARBITRATION.

(*Before* HENRY HAWKINS, *Esq.*, *Q.C.*, *and* THOMAS HAWKSLEY, *Esq.*, *C.E.*, *Arbitrators; and* G. POWNALL, *Esq.*, *Umpire.*)

(*Continued from page 558.*)

NINTH DAY—FRIDAY, MAY 28.

Mr. *Barlow* recalled, and re-examined by Mr. LLOYD.

In the valuation of the Peterborough Gas-Works the stock in trade was valued separately and paid for. As those works had a single proprietor, I did not charge the income with directors, but in this Dundee case it was a payment for services rendered, which, if not performed by the directors, would have had to be performed by some officer. With respect to the general expenses and repairs, I have taken the average of four years, as many of these expenses do not occur every year; and, as the company knew the affair was to be transferred, it is not unreasonable to suppose that the expenses were diminished as much as possible in the last year, so as to increase the profits. In taking the bad debts at 1¼ per cent., that was from information supplied to me, and I think it a fair estimate. It is not a hypothetical amount at all. I gave the figures yesterday, amounting to £1651 8s. in the four years, which is 1¼ per cent. on the gas-rental. The whole amount which has been allowed in respect of repairs and renewals for the year, which is taken as their year, is £140 11s. 4d., which may represent the amount actually spent in that year, but it cannot represent what was fairly chargeable to that year, as they would do nothing but what they were absolutely compelled to do. If a meter was stopped and would not work, of course they must make it a charge in the expenses of that year. The rates and taxes are given at the present assessable value. The risks and casualties at 1 per cent. include all casualties that may arise other than those covered by insurance. As to the alleged surplus land, there is one portion of the land, about one-eighth of the whole, which is at too high a level to be of any possible service for the erection of works.

By Mr. HAWKSLEY: Supposing you purchase this property at £100,000, and you pay the whole of that money, unless you have a further sum of, say, £10,000 to carry it on with it will be unproductive, which you must provide in some form or other. A company would raise that sum by share capital, and of course must pay dividend upon it. If it were so raised there would be a deduction for interest in making a valuation, because they have a certain capital, and spend a certain portion of that capital in the construction of works, and they employ a certain other portion of the other capital in carrying on the trade, and they are obliged to pay a dividend on the two portions. [A lengthy examination took place on the question, whether, supposing the gross profits to be the same, it signified whether that profit went partly to the shareholder, and partly to the debenture-holder, and partly to the banker, or what became of it; and the case being supposed of a company which had raised all its capital by shares, had no debentures, and always kept a balance at its bankers, the question was asked whether the £10,000, which had been suggested as the profit of such an undertaking, would pass into the pockets of the shareholders. In reply to which witness said that, even in such a case, in valuing it for sale, the interest on the sum necessary as trading capital for carrying it on must be deducted.] Supposing there is no capital whatever needed in the undertaking, except share capital, and that there is £10,000 to be distributed among the shareholders, the shareholders would not lose, because the gross profits are taken as the basis of the valuation. They would receive an equivalent either in money or in another form. I made a deduction of 6d. a ton in respect of the saving in the delivery of coals by means of a tramway.

Mr. Thornton handed in the title of the company to the use of the tramway, dated Jan. 25, 1860.

By Mr. HAWKSLEY: I cannot give any value to this grant at all, but if I had not made this deduction I should have been admitting the right of the company to that tramway.

By Mr. POWNALL: If it had been an absolute grant in perpetuity, I should not have made the deduction at all.

By Mr. HAWKSLEY: Any company under the Gas-Works Clauses Act has the right to create a reserve-fund to cover all risks, whether arising from explosion, or the blowing over of a gasholder, or from fire, or anything else which is in the nature of ordinary insurance. I think this company had such a fund to a small extent, and I presume they have divided it among themselves. The charge for meters is very low in Dundee; not much more than sufficient to cover what I conceive to be the depreciation of them. The portion of land which cannot be used for the purposes of a gas-work is the manager's residence, which is taken into consideration in the salary he receives. There is a bit of garden attached, which I think is an advantage. I should think the manager would want a higher salary if he had to provide himself with a suitable house elsewhere, or if his garden were taken away. About 5 to 5½ acres, I think, are fairly available for the purposes of the gas-works. If the whole of the works were pulled down and reconstructed, and the four small gasholders pulled down, about 2 million feet a day might be made. The Glasgow City and Suburban Company had 780 retorts in action in the last mid-winter, and they had 88 surplus ones; and the whole ground is inconveniently filled up. In fact, there is scarcely any space for storing cannel, and the manufacture is carried on, in consequence of the deficiency of space, at a great expense, and I have it under consideration to pull down those works entirely and build new ones, from the want of space.

By Mr. HAWKINS: The net profit is that which a man pays you for when you sell the concern. That net profit is arrived at after making every deduction for every pecuniary expense and every pecuniary sacrifice which you make. Supposing a trader has £10,000 out at mortgage at 5 per cent., and he calls that in and puts it in his trade, that is a pecuniary sacrifice. I can see no difference whether a trader calls in his own money, or whether a company of different individuals raise between themselves the £10,000 in sums of £25 or £50. If the £10,000 were borrowed by the company from the bankers, of course it would have to be paid back, and the parties taking over the undertaking would have to repay that or borrow it afresh, which would be the same thing.

By Mr. HAWKSLEY: Supposing I bought shares to the amount of £10,000 in a bank, and the bank paid only 5 per cent. interest, I should say there was not only no profit but a positive loss, because I could do better with my money than putting it into a bank paying 5 per cent. I might have given £100 for the shares, but they might be worth only £60 in the market. Supposing my interest in the bank were to be transferred to somebody else, whether I should get that £10,000 back, or any part of it, would depend upon various circumstances. Of course, if I could find anybody to give me £10,000 for what originally cost that sum, I should lose nothing;

but if I had invested my £10,000 at par, and the bank were only paying 5 per cent., and with not much prospect of paying more, I should say I had made a bad investment, and had lost a portion of my capital. Supposing the bank were an improving bank, I might say I will hold these shares, and they will be worth more than £10,000. They might ultimately be a good investment, and sell at a profit.

W. Haywood, Esq., examined by Mr. MICHAEL.

I am engineer and surveyor to the Commissioners of Sewers of the City of London, and prepared plans and estimates for the City of London Corporation Gas-Works, both in 1866 and last year. I have not had to do with gas-works themselves, but I have been the adviser of a corporation in all their gas oppositions and gas matters for the last 10 or 15 years. In November last I received instructions to value the property of the Dundee Gaslight Company, and have made an estimate of the value which is to be put upon these works. [The estimate was here handed in.] I ascertained the net profits of the company, and then multiplied those profits by such a number of years purchase as appeared to me to be just and reasonable. I have taken mainly the year 1868, and the figures supplied by Mr. Guild. The gas sold in that year amounted to £27,545 17s. 10d.; and deducting discounts, £706 17s. 9d., left £26,839 0s. 1d. I then added for meter-rents a sum of £1216 12s. 10d. Also for the residual products £1217 17s. for coke, and £2062 6s. 10d. for tar, making together £3280 3s. 10d., and then deducted the expenses for reducing those residual products £865 6s. 1d., which left £2414 17s. 9d. That makes a total of receipts £30,470 10s. 8d. Coming to the expenditure, there is first the coal carbonized, £14,850 16s. 10d., and used as fuel, £95 4s. 4d., the total working out to £14,946 1s. 2d. I put down for extra cartage, if the tramway is discontinued, 6d. per ton, which comes to £331 4s. 6d.; materials for purification, £260 8s. 4d.; salaries, £558 11s. 6d.; wages, £2704 10s. 9d.; general expenses, £325 3s. 3d. I have taken the mean of the four years expenditure, whereas the last year's expenditure—I mean for 1868—amounts to £471. I have, therefore, taken less in my average than the statements supplied to me. For general repairs I have taken £400. I have taken that in this way: I have been furnished with some statements of the original value of the works, and I find that the cost of the buildings is therein set down at £22,802, and the plant £18,402, which together make about £41,000, and 1 per cent. upon that is £400, or thereabouts.

By Mr. HAWKSLEY: That 1 per cent. is not to keep the works up in perpetuity; it is to keep them in general repair. Keeping them in a general state of repair is one thing; renewing them when thoroughly worn out is another.

Examination resumed: For renewal of retorts I put down £539 15s. 5d. For repairs and renewals of meters I have taken 3¾ per cent. on their first cost, which was shown by the schedules put in by Mr. Foulis to amount to £20,822; 3¾ per cent. on that amounts to £762 1s. 6d. The number of meters given to me is 15,600. For service-pipes I have taken £243 0s. 6d.—that is the mean of four years. In the year 1868 Mr. Guild sets down £106 7s. 6d.; but that is out of comparison with previous years, and, therefore, I have taken the mean of four years.

By Mr. HAWKSLEY: These figures stand in the accounts as an annual charge, and manifestly would have to be deducted.

Examination resumed: Rates and taxes I put down at 3s. 7½d. in the pound. I have estimated the rateable value at £2620, which gives a sum of £471 19s. 3d. per annum. Rents, rates, and feu duties are set down at £123 3s. 9d., but it has been given in evidence that that included an annuity of £45 upon the life of a female aged seventy, which I have deducted, leaving £78 3s. 9d. For the bad debts I have deducted the gas-rental and meter-rental together, and have taken 1¼ per cent. upon that, which amounts to £350 13s. 11d. I have taken insurance upon the sum of £22,000—representing buildings, apparatus, and a certain stock of coals—at the rate of 10 per cent., which works out to £110. Risks and casualties I have taken at 1 per cent. upon the gas-rental, which gives a sum of £275 per annum. Renewal and reproduction of buildings, plant, and fixtures I have taken upon the estimated value of £77,251, which I call here £772 10s.; that is the amount for reproducing every part of the works, the meters excepted, as from time to time they are worn out and past reparation. For floating capital I have taken £10,000 at 4½ per cent., which gives £450 per annum. All these items added together give an expenditure of £23,579 3s. 10d. Subtracting that from the gross receipts, leaves a balance of net profit of £6891 6s. 10d. I have given 20 years purchase of those profits—£137,826 16s. 8d. In giving 20 years purchase I have assumed that this is a permanent concern, and that it will for a long course of years continue to pay something like 6 per cent. to the person who takes it. I have assumed that the property is in such a condition that it can go on increasing from year to year at something like the same rate at which it has been going on; had it not been for that I should not have given 20 years, or anything like it. My valuation proceeds on the assumption that the works are in thoroughly good condition, whereas the works necessarily cannot be in a new condition, and therefore I make an allowance for deterioration of buildings, plant, mains, and services of £22,916, which is the first item of deduction from the £137,862. Then I have given this lady of seventy years of age a life of nine years to come, and I have multiplied that by 7½ years purchase, which gives an amount of £837 10s. as the present value of that life annuity. That, added to the £22,916, makes £23,253 10s., and is the total amount of my deduction. Subtracting that from the net profit at the 20 years purchase leaves £114,573 6s. 8d. as the value of the undertaking to the purchaser. I have further reduced that into annuities, and have assumed them to be, looking at the security which is offered, worth 4 per cent., which gives the annuities at £4582 18s. 8d.; that is the value of the gas companies trade and goodwill of the property in the shape of annuities in perpetuity.

By Mr. HAWKINS: I have not made the directors salary a deduction, and therein I believe I differ from most other valuers. I have expressly excluded that.

Examination resumed: As to the surplus land, if it can be clearly shown that there is a margin of land beyond that which should be left for the fair extension of these works, the company are entitled to that; but I do not think there is such a margin. With regard also to the question of surplus power, if it can be clearly shown that there is surplus power which can be utilized at a future day, the company are entitled to be paid for it; but I do not think they are entitled to be paid for it at what it cost them, or at its nominal present value. To expend money on retorts some years before they are wanted seems to be an injudicious expenditure. For instance, if a retort is worth £20, and that retort will not be wanted for seven years from the present time, then, in compensating the company for that retort, they should say what is the value of £20 seven years hence, at the present time, and that should be the mode of arriving at the compensation to the company. I have no doubt myself that there is surplus power, and I equally think that that surplus power would be of value to the persons who buy these works. I should not ignore that, but I should value it in the shape I have stated. The same remark applies to the surplus manufacturing power. I have made an allowance for the manager's house—that is to say, I have assumed that if a man has a house and garden given to him, it is always considered equivalent to so much income.

Cross-examined by Mr. DAVISON: I never had anything to do with gas-works before I went to the corporation of London. I was engaged in the opposition to the City Gas Company when they applied to Parliament about twelve or thirteen years ago. In 1866, when the City proposed to make their own gas, I was engineer-in-chief, assisted by Mr. Stevenson, Mr. Hughes, and several others. I think we proposed to make 16-candle gas at 3s. 6d. The London companies were then charging 4s., and were making gas slightly in excess of what they were bound to make, which I think was 14 candles. The corporation again brought in their bill for competing with the companies last year, and the result was that we obtained a measure by which the companies are bound to give an increased illuminating power, and at a reduced price. I have never been examined in a gas committee except on these inquiries about the London companies. Within the last two years negotiations have been going on for the purchase of certain of the City companies by the corporation, and I have, for the purpose of advising the corporation, valued these companies interests, but we could not agree upon terms. I have designed gas-works with Mr. Stevenson. I believe in 3s. gas at 16 candles power, and a dividend. Whether a company that has a 5s. 4d. price and 18 candles makes a good thing depends upon circumstances. It is quite possible, though it is not probable, they might lose at that. It depends upon the skill and other circumstances—local conditions, leakage, and all sorts of things. I should say Wigan cannel would produce 11,000 feet of gas per ton. I have seen all the valuations, and have heard all the evidence. I had made out a valuation upon another principle—a principle which has been ignored, but which has a good deal of soundness in it for all that, if properly taken by a person who understands it. That was a structural value, *plus* five years, I think, purchase of the profits, which I thought was a reasonable time; but I did not consider that was the fairest way of valuing, and therefore I destroyed it. I have not allowed for the directors, because the directors are paid out of profits, and they will have a right to the whole of the profits. What I have desired to arrive at is the real value of this concern to anybody who would like to take it. The proposition set before me is to value this trading company's interest, and I have put such a value upon it as I believe it would fetch in the market, which, of course, is a very limited one in the case of gas companies. It is neither the value to this company, as it may estimate itself, nor the use or value which it may ultimately be to the corporation, but it is the value of a trading company, having the land, apparatus, and pipes, and having to a very large extent the monopoly of supply. The net sum is £6891 6s. 10d.

Mr. DAVISON: Is not the bankers interest taken off before you arrive at the £9740?

Mr. HAWKINS: I do not think that £9000 appears in his accounts at all.

Mr. DAVISON: No, sir; but what appears in Mr. Haywood's account is £6891 6s. 10d. Then you have to add to that the tramways, £331 4s. 6d.; the insurance, £110; risks, £275; renewal of works, £772 10s. 10d.; interest on floating capital, £450; meters, and bad debts, and taxes in excess, and it works out to the identical figure.

Cross-examination continued: The borrowings of the corporation have ranged for some few years from 4½ to 4¾, and they have reached 5 per cent. The money has been principally borrowed upon dues and revenues. The corporation bonds are, as near as possible, first-class security; but they are not quite so good as Dundee gas annuities, which are backed up by a rate that will take every extra pair of breeches away from every man in Dundee to pay for it. There are no limits to it. The coal-dues are fixed, and cannot exceed a certain amount. In my valuation I have allowed for the probable extension; I should say it ought to be for an extension for 20 years, or thereabouts, to justify my figures of 20 years purchase. If the works are rearranged, there is sufficient land to my mind for 20 years. The particulars of the rearrangement must, of course, be left to the purchaser. The make at the present moment is 140 millions a year, and I have taken the rate of interest at 19 per cent. in four years. I rather think the corporation will not sell so much gas as the company have done in the four years upon which I have taken the average, times being bad; but I have no doubt that there will be an increase. I do not agree that the normal increase is about 10 or 12 per cent. per annum. The usual course in gas-works is to keep about 15 per cent. of surplus retorts. As fast as they are used up others should be erected, to meet all contingencies. Of course they should have storeage power in the same way.

Re-examined by Mr. LLOYD: Nearly the whole of the corporation bonds were sold at a premium almost immediately. I do not know what the premium is now.

Charles Lee, Esq., examined by Mr. PHILBRICK.

I have had considerable experience in the examination of estimates generally. I inspected these works in October last, with Mr. Maclaren and Mr. Foulis. They had previously measured the works, and had weighed or had calculated the weights of the different works of the operators, and I went over the whole of them and checked them. I also inspected the works of the company in conjunction with Mr. Barlow, and the valuation, as corrected, I agree with, showing £22,916 as depreciation. I have made a detailed valuation of the undertaking, based on the income of 1868, for the year ending May 31, which brings out a corrected profit for the year of £6408 14s. 1d. I deal with that in order to arrive at the valuation of the undertaking by 20 years purchase. Applying that 20 years, I have taken into account the possible advantages which might accrue to the undertaking; otherwise I should only have put it at 16 years purchase. Making the additions I think it necessary to make, it brings out a total result of £134,195, which is subject to a deduction of £22,916 for depreciation, leaving a net result of £111,279; bringing out the annuities, at 4 per cent., to £4451, which in my judgment is a full and fair valuation of the undertaking, as a going concern, to be paid by the commissioners to the company.

Cross-examined by Mr. DAVISON: My statement does not differ from Mr. Barlow's in many respects. I think you will find it differs from him on the depreciation of meters and some other matters. I have £20 less for service-pipes than Mr. Barlow, but mine are actual figures and his are calculations. For renewal of meters Mr. Barlow has taken 5 per cent., and I am in the habit of taking 3 per cent. For rates and taxes I always take 10 per cent. upon the income of the company. For risks and casualties I allow 1 per cent., the same as Mr. Barlow. The interest at 5 per cent. on £10,000 is right, as you cannot do without floating capital.

By Mr. HAWKSLEY: I think directors are necessary to carry on the concern and to get together a connexion.

Cross-examination resumed: I give 20s. a pole for the land, instead of 15s., from my own judgment.

Re-examined by Mr. LLOYD: There is no substantial difference in the mode in which I proceed to rate gas-works and to value them. The difference is to be made between the lessor and the lessee—what is to be allowed to the tenant for the tenant's interest. We arrive at the sum which it would be worth to let, and then we give the tenant a sum out of that. The sum at which it would be worth to let would be the rating value. In order to arrive at that result, we have to go through the same process, and to make the same deductions. Our custom is to apply to the company for a half year's balance, and from that we arrive at the net sum which the tenant would obtain. I have valued the whole of the gas companies in London for rating purposes, and what has given me a knowledge of the constructive value is that in that case it is by parishes; but then we arrive at the structural value. If I could get what the actual value of the concern here is, including its buildings, plant, pipes, and all the like, it would give me the value of the thing which one party is to part with, and the other party is to get. The principle is often adopted of getting the net profits and taking a certain number of years purchase for that when valuing the goodwill, and if it is rightly done, it results in pretty much the same thing. There is an immense difference with engineers and surveyors upon that subject. I do not adopt it.

TENTH DAY—SATURDAY, MAY 29.

Charles Stevenson, Esq., examined by Mr. LLOYD.

I am a member of the firm of Hunt, Stevenson, and Jones, and have had considerable experience in the rating of gas-works. In my valuation I have proceeded in the same way as the other witnesses—in first getting the gross revenue of the company, and then making the proper deductions to get it to a net. I begin with £28,763, which includes the gas-rental and meter-rents. That is the gross income from all sources of the company. Then, as to deductions to be made for expenses, I have—coal, £14,946, which is an agreed figure; to that I add £260 for lime, making £15,206; and then I take off residual products, and that leaves the net cost of coal £12,791. I have charged the retorts and settings on the average of the last four years, £400, and service-pipes £243. Actual figure for wages, not including salaries, £2705; general expenses, £325; and repairs, £354; both upon a four years average.

By Mr. HAWKSLEY: I cannot tell what is included in general expenses. It is the sum that appears in the annual statement of the company. I do not know how much of that is properly chargeable upon transfer, but I apprehend they are revenue charges. I adopted the rectified figure.

By Mr. LLOYD: I have taken the direction, four years average, at £216; salaries, £681; meter repairs and renewals, I think, at £1,000; and I have considered it would require £635 per annum to reproduce the meters in 20 years. The bad debts are an average of four years, the same figure taken by Mr. Barlow. Setting aside £635 annually, I would in 20 years replace the whole, at 5 per cent. interest. I have taken the discount at £707. I have made an assessment of £2822 for rates and taxes.

By Mr. HAWKSLEY: The gas-rental is gross, and that has to be diminished by the amount of the bad debts and discounts.

Mr. LLOYD: To bring it to a net rental that would be necessary. Whether you take it off as a charge, or deduct it from the gross rental in the first instance, does not make any difference in the account.

Mr. HAWKSLEY: No; but it makes a difference when we come to compare the figures, because some accounts are made one way and some another.

Examination resumed: Rates and taxes are £506. I have taken the interest on a working capital of £9000 at 5 per cent., making £450; insurance, £100; renewals, £775. I arrive at that by 1 per cent. on £77,500. That deducted from gross rental leaves net £7405. I believe my deductions are less in some respects than those made by other witnesses. I have capitalized this net result at 16½ years purchase. Twenty years is applicable to a well-assured rental or income. This is an income derivable in small part from land, buildings, plant, and profit in trade, and I take it, therefore, at less years purchase. I think the purchaser ought to have 6 per cent. for his money, taking all contingencies into account; 16½ years purchase gives £122,182. I deduct £20,000 for necessary repairs and depreciations. I got that figure from Mr. Foulis's account. That brings my net to £102,182. I add to that £5786 for surplus power, which figure I take from Mr. Barlow. I have got a head of "Surplus ground, if any," for which I have put £2200. I have heard in this room there is an acre in excess of the requirements. Upon that point I am unable to speak; but, assuming it to be the case, I value it thus: Annual rent obtainable for the whole undertaking, £2822; divide that between plant, buildings, and land, there is a mere sum of £100 a year for an acre of land; at 22 years purchase that is £2200. I have valued some cottages there, which gives a total of £110,393. From that is to be deducted the feu rent and the value of the annuity. I have taken the latter at 6¾ years purchase, which, at £45 a year, is £304. The feu duty, at £3 6s. 8d., I take at 30 years purchase, or £100, being a well-secured rent. Then there is £20 per annum payable to the town, which, at 30 years purchase, is £600. There is a ground-rent of £21 per annum for 21 years on the premises in Scouring Burn, so that at 14 years purchase, or £294, leaves £1298, which, deducted from the £110,393, leaves net £109,095 capitalized value of the undertaking to be transferred. I convert that into annuities at 4 per cent., which gives £4360.

By Mr. HAWKINS: The little item of £225 for cottages occupied by workmen, produces, I have heard, £15 a year to the company. I believe they are not taken into consideration in the wages.

By Mr. LLOYD: If I had taken 20 years purchase, I should have made further deductions in order to have made it a more assured income.

Cross-examined by Mr. DAVISON: I never valued gas-works, whether for transfer or not. I get 6 per cent. to work out 16¾ years, if you take it in figures. That makes a difference of £1234 against you in the capitalization. I never valued land in Dundee. I have never taken trading property at 20 years purchase. I heard Mr. Barlow say that 17·7 was the average of purchase of gas companies—not 20 years. I took the undertaking as I found it, with the tramway there. If the tramway is to come off, it is undoubtedly a charge against the company.

By Mr. LLOYD: If Dock Street became a greater traffic thoroughfare, and the Harbour Trustees were doing works there which would require the streets to be kept unencumbered, in that case the tramway would be in the way. That is one of the contingencies which would reduce the certainty of the income. I should take the cost of the tramway off in the same way Mr. Barlow has done in that case.

By Mr. HAWKSLEY: In making an estimate of the repairs of the retorts and settings, it would be fair to ascertain how much gas a retort will, on the average, make before it is worn out. Then, dividing the quantity of gas made by the number of feet which a retort would make, that would give the number of retorts which would be replaceable, and then, valuing those at the proper amount per retort, would give the fair amount due to the repairs of the retort. That would equally apply to the settings. I have not deducted the property-tax. The lady's income is not merely chargeable upon the income of the company, but also on the land. I do not know of any instance in which an interest arising out of property created by Act of Parliament has ever been valued at 16½ years purchase. The incoming tenant to the gas-works will make £9700 a year. He must make provision for the past deterioration of the premises, because the previous reduction starts from the beginning of the undertaking. It is a provision that you should make annually from the beginning of the undertaking, not from the present period. If the calculation of 1 per cent. for deterioration did not produce £20,000, the per centage would have to be increased, and, if it produced more, it would have to be diminished.

Edward Ryde, Esq., examined by Mr. PHILBRICK.

I am a surveyor and valuer, and have had very large experience in the valuation of property, and have valued very largely gas-works. I approach these subjects as a land surveyor. I am not a gas engineer. These concerns are compound properties. There is the landed estate, which is worth so many years purchase upon the rental it would produce. There is the goodwill in the trade of a going concern, which is worth so many years purchase of the net profits which can be made out of it; and then there is the tenant's plant—the meters and utensils—which of course have to be paid for; and I have always held that the proper way to value these properties is to value them as every other description of landed property is valued on those principles, and not to take, as engineers appear to take, the mere number of years purchase of what they say are the net profits, and arbitrarily fix that as the value of the undertaking. I have bought all kinds of trades, and I never gave anything like 16 years for the goodwill of any trade, to say nothing of 20 years purchase. The most expensive trades we buy are public-houses, and we never hear of any such sum being claimed as that. I ascertain what would be the annual rental which the occupying tenant could fairly afford to pay for the property in order to get the permanent element of value. I then put what, according to a certain number of years purchase, is the value of the land. I then ascertain what the profit in trade should be, and I put that at another number of years purchase—a very different number from what the landed estate would be. I then add the value, the tenant's plant, and utensils. I assume the property to be in tenable repair as a going concern, and if any sum is required to make it so, I correct that afterwards. When there was no material evidence, I have adopted Mr. Guild's figure, expect with regard to the maintenance of service-pipes, which I have taken on a four years average. I have taken the gross receipts for the year from private consumers and public lamps, less the discount, and, adding the meter-rents, I bring out a total of £28,055. I then proceed to get the net receipts by deducting the working expenses. I take off the coal and lime, and deduct the residual products from it. Then there are the salaries, general expenses, and the meters. As to their renewals, I have taken Mr. Penny's figures. The only figure which is mine is a sinking-fund of 5 per cent.

By Mr. HAWKSLEY: Mr. Penny said the meters would be worth £20,000, and would have a life of 15 years. Taking the sinking-fund on that idea, it amounts to £940.

By Mr. PHILBRICK: I have taken the actual figure for "Bad debts." The "Water supply, £25," is an actual payment. I take the rates in the next item at 3s. 6d. in the pound, on an assessment of £2925, instead of 3s. 7½d.

Mr. HAWKSLEY said that, as a matter of fact, there was no water-rate; the public works were in the hands of the company, with no power to levy any rate at all.

Mr. LLOYD said for a fact, £24 9s. 5d. was annually paid for water.

Mr. GUILD, on being appealed to, stated that it was included in the general expenses; he had deducted it from the revenue in the rectified account.

Examination resumed: I reduce to an annual rental value the rates and taxes. Those items altogether are £19,345, leaving net receipts £8710. From this I take out such a sum as would satisfy a tenant, leaving him to hand over the rest to his landlord. To do this I first ascertain what tenant's capital he would require, and that capital includes, of course, the meters, which are tenant's chattels, which are not on these premises at all, but are all about the works. A tenant would require capital sufficient to purchase the meters, and pay the working expenses for about four months, until he could get in his three months accounts, and derive money from the concern. That, in this case, I put at the round sum of £25,000—viz., four months working expenses, £7000; valuation of meters, £17,500. I have assumed them in tenantable repair, but not new; and I have put £500 more for tools and implements, making £18,000. Upon that £25,000 I allow 5 per cent., which is £1250; then I give him as a trade profit, remuneration at 10 per cent. on that, and as an insurance-fund against risks and casualties of every description, 2½ per cent. on that trading capital.

By Mr. HAWKSLEY: I put this valuation hypothetically. It cannot be valued otherwise.

By Mr. PHILBRICK: On the £25,000 that brings out a deduction of £4375. In order to get the net annual value there would firstly be repairs of premises and works. This is from actual experience. I have never been able to keep in repair buildings of this character for less than 10 per cent. of a yearly tenant's rent. This also includes plant, therefore I take, as a round figure, something like 12 per cent. on the annual value as the sum which ought to be spent yearly in repairs—that is £500. For insurance I put £100. As to renewals, I have estimated £9000 for buildings, excluding boundary and fence walls, gasholder-tanks, or such things as that, which would last pretty well for ever, or beyond any sinking-fund. That sum represents the value of such perishable parts as may be estimated to last, on an average, for 40 years. I have provided such a sinking-fund as would reproduce that £9000 in 40 years; that is, £72 a year, at 5 per cent. I have dealt in the same way with the plant—£16,000 as the worth, and a life of 30 years, exclusive of mains and services. I have given the mains 40 years, and service-pipes 20. I thus arrive at £810 for renewal, making the deduction against the gross annual rental £1410. That leaves the net annual value £2925. Scouring Burn has only a lease for about 21 years. There are some gasholders there, therefore I have taken out the rent. If they are not able to renew this property when the lease expires, they must, I apprehend, get other property; I have, therefore, taken that £123 to be paid in perpetuity, which leaves £2802 net. It is very liberal to capitalize that at 20 years purchase. I have never known of such a case with property of this kind. It would amount to £56,040. Before that is arrived at there is a deduction of £2040, which should be expended at once to put this property into a thoroughly tenable state of repair. That sum being spent upon it, and these sums being laid by yearly, it would maintain the property in a tenable state of repair for ever. That leaves the fee simple value of the landed property, in its present state, £54,000. Then, on this principle, there is the precarious element of the

trade carried on. I deal with the £2500 trade profit, and put it at six years purchase. That is a question of judgment, and a thing to be taken into account by the arbitrators, as to whether it should be five, six, seven years, or whatever it is. Six years amount to £15,000. Adding the £18,000 for meters, tools, and implements, it makes £33,000, which, added to £54,000 for the estate, is £87,000. Then, with reference to the surplus land, if the company are capable of doing a larger trade in some way or the other, that should be taken into account. There is no part of this land which, as it seems to me, any gas company, or any man of judgment in his senses, being the owner of it, would sell. It is obvious it would be kept for the purposes of a gas company. If it was to be taken into account at all as land, it was what it was worth to a gas company, and not what it was worth for other purposes. Taking these circumstances into account, and that there is a manager's house on the top, that there are cottages up there, and that there is land down below in Dock Street which is not fully used, I have added a sum of £3000, making my valuation £90,000. As regards the meters, if they were not in a tenantable state of repair when they were taken over by the company, then whatever sum is necessary to make them tenantable should be deducted. On the other hand, if there was a surplus plant, whatever its value, having regard to the time when it would be required for the undertaking, it should be added. With regard to the capitalization of the sum, these annuities would be liberally done at 4 per cent. —liberally to the sellers, I mean.

By Mr. HAWKINS: It is dividing the £90,000 by 25.

Mr. HAWKSLEY: Suppose Mr. Guild's figures make a gross profit of £10,000 a year, which gross profit is differently dealt with, of course, by different parties—that is, gross profit after deduction of what he considers all ordinary expenses—the general effect would be to put nine years purchase upon it?

Witness: As nearly as I can calculate it. If the gross profit is £10,000 a year, and I calculate it at £90,000, that is nine years purchase.

By Mr. HAWKINS: I have taken the total amount of net profits, and divided them between the landlord and tenant, giving that which is due to landlord 20 years purchase, and that due to the tenant six years.

Samuel Hughes, Esq., examined by Mr. MICHAEL.

I am a civil engineer. I have had a good deal of experience in valuing gas-works for rating purposes and estimates for Parliament, and also for transfer, and have prepared an account upon which I base the value of these works to a purchaser. I have assumed a considerable increase over the present quantity of coal carbonized. I find that there is a present surplus power in the retorts, and I have been very liberal, I conceive, in my estimate. I have adopted the sum to be made on the basis of carbonizing 17,000 tons of coal per annum. I find the gas sold, on the last four years average, amounts to 7404 feet per ton, working out per annum 125,868,000 feet. The receipts from that (four years average) are £29,641 18s. The average price of gas realized has been 4·71s. The sale of residuals—coke, tar, &c.—at 4 9s. per ton of coal, amounting to £4165: meter-rents, 1·71s. per ton of coal, making £1453 10s: total, £35,260 8s. As to expenditure, at the same average, 17,000 tons of coal, at 21s., come to £17,850. "General charges," at 9s. per ton, makes £7650. "Interest on floating capital," at 5 per cent. on £10,000, is £500. "Risks and casualties," at 1 per cent. on net gas-rental, is £296. "Insurance on stock in trade, buildings, and apparatus," at 10s. per cent. on £25,000, is £125. "Railway privilege" (that is for the privilege of the tramway across Dock Street), 17,000 tons at 6d., which is £425. Total of expenses, £28,865, leaving annual gross profit £6395 8d., which capitalized at 20 years purchase amounts to £127,900. I deduct £17,632 for "depreciation of buildings, plant, machinery, tanks, mains, and services." Then there is an allowance for expense which must be incurred by the present owners of the works in compliance with the Sales of Gas Act. I understand the number is 5260 meters, making £2630. Adding those together, I get £20,262, leaving as the gross £107,638. To reduce that into annuities, I calculate they are worth 4 per cent., which works out £4306.

Cross-examined by Mr. DAVISON: I was on the same side as Mr. Barlow in the Glasgow case. I was examined on a transfer in the Neath case, on the side of the new company, who purchased the works. I am a great advocate for cheap gas. The estimate I made for the London Corporation was 3s. per 1000 feet of 18-candle gas, but only to pay the corporation for the mere interest of the capital—not as a company's profit in any sense. They were to have not exceeding 6 per cent., which was to cover a sinking-fund to replace the capital. The estimates varied between 3s. and 3s. 6d. I have not been actually resident as managing gas-works. I have had plans of construction submitted to me for revision. I have been engaged in engineering all my life. I have never constructed a gas-work. I have been to Dundee. The present price at Dundee, which I understand is 5s. 2d., is considerably more than it ought to be, considering the London price. The raw material in Dundee does not cost 1s. per ton more than in London, and we get gas in London for 3s. 4d. That is common gas; cannel gas is 5s. 6d. I believe the raw material in London for gas-making costs about 2s. per 1000 feet, and in Dundee about 3s. per 1000. I believe the gas in Dundee was being made by the company at very little over 3s., covering every expense. I see that in 1868 the net balance of revenue and the interest amounted to 21d. per 1000 feet. It is not quite 2s. of profit.

By Mr. HAWKSLEY: The balance I have is £9300, and that is divided by 105 million feet, the total gas sold. My estimate of 125 million is what I imagine the commissioners will be able to sell in the future. I am extremely liberal in taking 17,000 tons, when the total quantity carbonized now is 13,000 tons.

By Mr. LLOYD: In my estimate I have taken the maximum of power.

By Mr. DAVISON: I think it safer to make the commissioners pay for what I suppose they will make, taking off the cost of the raw material, than to take what is actually made, and so I value the surplus power existing in the shape of retorts as fixed. I object to the principle of basing it on one single year, still less six months. There are many things upon which a proper knowledge is not acquired in a short time. I cannot discover the working of the three years inferior, in which the manager was said not to be efficient. I do not find the expenses so very different in the four years. I find there was more gas made and less coal used in the last year, but that does not convince me that quite the same kind of coal was made. The difference from 14 to 18 candles would be little more than a halfpenny per candle per 1000 feet cost to the company in London.

By Mr. HAWKSLEY: I take that view on the ground that the cost to the company is solely in raw material.

By Mr. DAVISON: I want to get at the value of the works to the company as they were handed over to the commissioners. I conceive the Dundee Commissioners may not be always able to maintain the price of 5s. 4d. I should say the probability is they will have to reduce the price. If they are to make a greater quantity of gas than the works are now adapted to, they must evidently make additions to the works. "General charges" includes all the current expenditure of the company, exclusive of the raw material. That is the actual average of the last four years—not an average of averages, but the total quantity made, divided into the total quantity of expenses. The "depreciation" or "renewal" fund is not an average, because it is an addition to the current expenditure which the commissioners would be bound to provide for in carrying on their works. I have allowed £2019 for that. It is not taken by per centage. I take the structural value, or first cost of the machinery, including the gasholders at a life of 30 years, at £18,193. The annual sinking-fund, to restore that part of the works at the end of 30 years, is £382. I take the buildings at a life of 80 years; the structural value of them is £12,445; annual sinking-fund, £89. The structural value of the tanks (60 years life) is £10,092; sinking-fund, £62. Mains, structural value, £28,420, 66 years; sinking-fund, £142. Service-pipes, structural value, £7625, 16 years; sinking-fund, £378. Meters, structural value, £20,323, 16 years; sinking-fund, £1016.

By Mr. HAWKSLEY: No doubt five years at £2000 would fill the fund full. I do not think these works will fall down and require that fund every five years. I know there are exceptions where the Gas-Works Clauses Act is not followed; it is not a general law. In one or two cases Parliament has diminished the 10 per cent. on depreciation. Where companies are prohibited by their general Act from setting aside more than one-tenth of their nominal capital as a reserve-fund, they undoubtedly make up for that by keeping their works in a more efficient state of repair—viz., they expend annually, instead of setting aside a reserve-fund. In Dundee the general charges amount to 9s. a ton. In the London companies, most of whom are under the Gas-Works Clauses Act, the expenses are 13s. a ton, showing a much larger sum is expended annually to keep the works up. In large towns, like Dundee, labour and many expenses of that kind are just as heavy as in London. I should not say the difference in labour was as much as 10 per cent. In the Neath arbitration an award was given, amounting to 10·43 years purchase on the net profit of the company, as proved by their own witnesses.

Mr. HAWKSLEY: Is not the result of your valuation this, that for an assumed profit, assumed from these papers, of £10,000 a year, the directors are to get £4306 a year?

Witness: That is the result of it. In the only case with which I am perfectly familiar with the whole details, an award was given just over 10 years purchase of what was shown to be the profit of the company. I can see a consistency in the reduction of £10,900 to £4306, comparing it with other matters. I think, on the whole, that the risks and casualties of the London companies may have amounted to 1 per cent. I have no actual experience of my own that the deduction for risks, &c., in the Dundee Gas Company is 1 per cent. I adopt Mr. Barlow's figures, and concur in them.

Mr. DAVISON: Do you not know that, as a fact, in 1868 there was 10,990 cubic feet of gas made per ton?

Witness: "Made" is quite a different thing from "sold." I did not use the term "gas made" purposely, because it has nothing to do with the receipts. A ton of Fifeshire cannel may produce 11,000 feet of gas, but of inferior quality.

By Mr. MICHAEL: This kind of coal was supplied to the works during these four years, and only rather a small proportion was of the best quality. I have taken the absolute quantity of gas sold by the company during that time, and have had supplied to me the quantity of gas made as registered by the station-meter, and that corresponds with the quantity of unaccounted-for gas. Working out those two sums, I have arrived at the profit accruing to the company in respect of gas sold. That has been, I think, about 1s. 9d. per 1000 feet. That is a large amount, and in excess of the London companies. A large profit derived renders it more probable that the price of gas would be reduced. The annual rental of the Great Central Gas Company for the last year was about £80,000, but at the time of the Wood Street accident it was nothing like that. Taking the annual rental at £80,000, the 1 per cent. would be £800 a year, and that would carry it over 30 years. That would be for one accident alone.

John E. Clift, Esq., examined by Mr. PHILBRICK.

I am a gas engineer at Redditch. I have applied my considerable experience to making my present valuation of these works, which I believe to be fair and correct, bringing out a total of £101,755, and an annuity of £4070, capitalizing it on the 4 per cent. table.

Cross-examined by Mr. DAVISON: My figure for net profit of the year is £6318 10s. 10d. The "Sale of gas" is taken from the books. I have taken one year instead of four, because I thought it was the best, especially for sale of gas; 10 per cent. is not an unusual figure for the normal increase of sale of gas. By the statements that have been laid before me, the average at Dundee on the four years gives 9900 odd cubic feet per ton of coal. The 13,249 tons of coal is a figure, not an estimate. It is 13,049, and 200 tons which are presumed to be used on the works as fuel. As to the tramway, to load up the coals into the carts and take them (if it is only 200 yards) is worth 6d. per ton.

By Mr. HAWKSLEY: That is if they are brought by rail.

By Mr. HAWKINS: I consider that 6d. a ton is a very low estimate for the cost of carriage of coal from the ship to the yard.

By Mr. HAWKSLEY: The cost of the haulage, abstracted from the cost of loading and unloading, is 1s. per ton per mile. That does not include loading the coal.

By Mr. DAVISON: When it was represented to me that this siding across the road did not belong to the gas company—that it was there merely on sufferance, and that the Police Commissioners might remove it at any time—I considered that 6d. a ton was a reasonable amount to put down as a charge to meet that exigency if it should occur. It may be divided into—2d. for loading, 3d. for drawing, and 1d. for unloading. I have not considered how much of the coal is loaded from the docks and how much comes by railway. In either case it has to be unloaded; if it comes by railway it has to come out of trucks into carts, and is then carted, and, if it comes by ship, it would have to be unloaded out of a vessel into the carts.

By Mr. HAWKSLEY: I do not think it is usual that shippers put the coal into the trucks or the cart, as the case may be. The shippers do not pay the cost of unloading; they simply deliver it into the port in the docks, and after that the expense of unloading into trucks is in addition. I do not know whether at Dundee they put the coal upon the quay or into the trucks.

Mr. HAWKSLEY said that 2d. multiplied by 14,000, and then again by 20, was a serious thing. If it was against the company, the company must consent to it in the award. He wanted to know if anybody could tell him the actual fact. If the evidence was not extracted by the counsel on either side, the arbitrators were entitled to say that there was something upon which they were not satisfied, and upon which they knew there was one gentleman in the room who could give information, and they ought to have it.

By Mr. DAVISON: If the coals are delivered free at the works there could be but one unloading. I have seen the tramway. The ground which was

covered with stores of coal was on the side of the tramway. It had been unloaded out of the trucks on to the ground. I put the cost of a retort as set at £22 10s., or thereabouts. I estimate 1¼ per cent. for bad debts. At Redditch we are rated up to the full value. I believe I am a little higher than the other witnesses in "Service-pipes and repairs," because I consider that the service-pipes are subject to a larger wear than has been taken by any of the others. I believe no repairs of meters are included in the general expenses of repairs. I think the value the arbitrators ought to ascertain is the value of these works as carried on by the company. If the company have expended 50 per cent. more in wages than they should have done, it would go against them; £2704 did not strike me as an unusual amount for wages; it represents about 7d. on 1000 feet.

By Mr. HAWKSLEY: I should consider that the way in which the works were conducted should certainly be taken into consideration, if there was anything very palpable in the neglect or in the extravagance with which they had been managed.

By Mr. DAVISON: The use of discounts is to induce people to pay promptly, and you charge a larger amount for your gas to enable you to do that. They are also allowed to people who consume largely. If these discounts were only on large quantities, and had nothing to do with prompt payment, if the company were not bound to allow discounts, I should certainly think it necessary to take that off. I have not heard whether the commissioners take off any discount. I have never seen an account made up without "Risks and casualties." That item here is £268 a year. They are my own figures. I capitalize "Renewal and reproduction" at 20 years, on the basis that the amount for the risk for which we have provided meets the contingencies of any risk which may occur. I have given no surplus land. In their present arrangement I consider there is no spare land. If I were the manager, I should resist a yard of land being taken from the works. I think the whole of the land in front is required to lay down the coal as it comes into the works, and for the stores. If the works were taken down and rebuilt there would be spare land, but nothing very considerable. I could make twice the amount of gas on that land. I could make six times the amount there by putting purifiers over the gas-holders and over the retort-house, and by putting things one over the other. If the tramways were up there would be more room in the front.

Mr. POWNALL said that at an early stage of this inquiry he thought it would be desirable, if possible, to avoid putting the commissioners to the expense of a view. His opinion had since entirely altered, and he did not know what Mr. Hawkins or Mr. Hawksley might think, but if it came to him (Mr. Pownall), as oversman, to determine the question, he did not think he could do so without seeing these works, and also seeing Dundee and the land. He mentioned that alteration in his views now, because it might enable the counsel to shorten the inquiry as to the necessity of this surplus land, seeing that the arbitrators would have an opportunity of viewing it themselves.

Mr. DAVISON said he should not be doing his duty unless he asked the arbitrators for a view. From the way in which the case had been conducted there was a reason why they should see the works, but that would not settle the question.

Mr. POWNALL said Mr. Hawkins suggested to him that it was desirable to ask whether both parties desired that the arbitrators should go as well as himself. They would not go together, but would take an independent opportunity of viewing the works. If they were to wait till they could all go together, it would postpone matters for a considerable time.

Mr. HAWKSLEY thought it would be sufficient that the oversman should go on behalf of all three. It was very desirable that the expense of all three going to Dundee should be spared if possible.

Mr. DAVISON said he would be content with Mr. Pownall going alone, with some one to show him over the works.

Mr. LLOYD: Then that may be considered to be said by both parties.

Cross-examination resumed by Mr. DAVISON: It is obvious that if you carted from the docks or railway you could put the coal or the pipes where you pleased. I think by having these tramways the ground is quite as available for placing the coal as it would be if it was carted, because the coal can be dropped anywhere along the sides of the tramways—there are the spaces all down the sides. If there was to be a railway into the retort-house, the works would have to be reconstructed. I should put a turntable at each end, and occupy the whole of Dock Street with a retort-house, and a coal-store on each side. The rails are necessarily there to get the coals into the works. No doubt when the corporation get these works into a better condition, and expend a lot of money upon them, they will remove the retort-house from the back to the most prominent place close to the chemical works, and place it along the front, and so take away the whole of the rails, simply running the trucks to each end of the retort-house and along it. If the tramway is to be taken up, then the coal will be carted.

Mr. HAWKSLEY: If the 6d. per ton goes, so does the railway go with it.

Mr. DAVISON: And so does the land accrue.

Witness: Under any circumstances, you will find that the policy of the corporation will be to use the front land.

William Hay, Esq., examined by Mr. LLOYD.

I am the provost of Dundee. I have been conversant with all the proceedings with respect to the transfer of the gas-works. I remember the occasion of the proposed amalgamation of the two companies in the early part of 1867. The effect of that was to create some excitement and alarm. The corporation took up the matter, and petitioned against the bill as being injurious to the community; the result was that, acting under the advice of others, it was thought that the better plan would be to offer to purchase the undertakings of both companies. The main objection to the proposed amalgamation was on the ground of destroying the power of competition, and thereby leaving the town to the mercy of the companies, both as to price and quality. The Amalgamation Bill proposed to repeal "Hume's" clause, which gave us the best quality at a fair average price, and we thought that very injurious. They proposed also to bring in certain money bills to raise capital, and in those bills they put in a clause practically repealing "Hume's" clause. Having agreed not to oppose the money bills, although we found this clause introduced, we were precluded by the chairman of the committee from giving evidence upon it, upon the ground that we had no *locus standi*, in respect of that agreement.

Mr. HAWKSLEY: Did the bill pass?

Mr. LLOYD said it did, under the circumstances he was going to state. His learned friend had said from the first that they were not bound to more than a 14-candle gas clause, and that the effect of the bill was to remit him to that position, being obliged to supply gas of only 14 candles. He (Mr. Lloyd) was going to show that that had nothing to do with the matter.

Mr. DAVISON objected to Provost Hay giving evidence upon that matter.

Mr. HAWKSLEY said all courts had decided that they could not review the circumstances under which a clause came into an Act of Parliament.

Mr. HAWKINS said the question was whether this was evidence.

Mr. LLOYD said he would pass from that point, but he wished it to be understood that he was prepared to state all the circumstances, which would give an entirely different colour to the effect of the clause from that which had been put on it by Mr. Davison, and that in his observations he intended to do so.

(To be continued.)

Miscellaneous News.

EUROPEAN GAS COMPANY, LIMITED.

The Annual General Meeting of the Shareholders of this Company was held at the Offices, No. 11, Austin Friars, London, on Monday, July 12—W. WHITE, Esq., in the chair.

The SECRETARY (Mr. H. M'L. Backler) read the notice convening the meeting and the report of the directors, of which the following is an abstract:—

Your directors have the pleasure to report that the stations are all in excellent order, and—no works of special importance being now in progress—a few remarks only will be necessary in relation to each establishment.

Amiens.—Increase of lights, 859. The shareholders were informed, by the last half-yearly report, that a large stock of coke had been accumulated here. This has been valued at a very low price, in order to provide against the possibility of having to consent to considerable reductions in order to effect sales. It is, however, probable that the estimated value will be exceeded, in which case the heavy difference will be recouped to the advantage of a future year.

Boulogne-sur-Mer.—Increase of lights, 1138. The satisfactory addition to the profits fully justifies the anticipations expressed by your directors on a former occasion, and they now again venture to intimate their opinion that, judging from current returns, a further advance is likely to take place during the present year.

Caen.—Increase of lights, 487. The business of this station continues to improve, and an expectation may be entertained that its earnings will gradually become larger in amount, although the progress may not be rapid.

Havre and Ste. Adresse.—Increase of lights, 1309. The exceptional increase of profits is owing in great part to the International Maritime Exhibition held here during five months of the past year; but the ordinary business of the company shows a healthy growth, which must tend to maintain the returns at a satisfactory amount. An enlargement of the purifying apparatus and an additional station-meter will be required here very shortly.

Nantes and Suburban Districts.—Increase of lights, 2427. The trade of this city still remains in a depressed state, and the additional lights, which compensate for those in total or partial abeyance, could not have been secured without great exertions on the part of the company's officers. In addition to which the inducement of fittings at very low prices was offered by the company. Thus the former amount of profit has not only been maintained, but even exceeded, under circumstances of unusual difficulty. As soon as business shall revive, it is certain that the large number of lights already fitted, and but little used, will again come into full operation, and it may, therefore, be expected that this station will then resume the course of prosperity which has been only temporarily interrupted.

Rouen, Sotteville, and Suburban Districts.—Increase of lights, 889. Had gas been consumed in all cotton factories here, throughout the twelve months over which the accounts extend, on the same scale as during the last portion, a better return would have been produced, but any increase on the large amount of improvement realized in the previous year, will doubtless be admitted as a subject for congratulation. An addition to the number of purifiers has become indispensable at this station also.

Summary.—Total increase of lights, 7109.

The supply of coals used by the company was secured on favourable terms, as the shareholders have been already informed, but this advantage has been nearly balanced by the low price to which coke has fallen, in common with other descriptions of fuel.

The additional profits realized are, therefore, mainly derived from substantial increase of business, combined with careful management. This must be regarded with satisfaction, especially as an earnest of the future, the prospects of which are, in the opinion of your directors, exceedingly bright and cheering.

The outlay will continue limited to the strict requirements of the company's engagements, and the means of carrying them out; judicious economy being also exercised in every department, with the hearty concurrence of the company's officers.

Your directors recommend the payment of the usual dividend at the rate of 8 per cent. per annum, together with a bonus at the rate of 3 per cent. After providing for this, together with interest on debentures, a balance will remain of £3753 3s., to be added to the reserve of undivided profits.

Notice has been given that two of your directors (Lewis Cubitt and Walter Thomas Fawcett, Esqs.), and both auditors (Felix Ladbroke and William Jones Lewis, Esqs.), retire from office at this meeting, but, being eligible, will be proposed for re-election.

The CHAIRMAN, in moving the adoption of the report, said it had no doubt struck every one present that Amiens was really the only exception to the general increase of the profits of the company. The cause of that station presenting so bad a return was, as had been stated in the report, that the company had there a very large stock of coke, which, for the sake of being on the safe side, had been valued at an extremely low price. It was more than probable that it would realize more than it was taken at, and if so, the benefit would appear in the next year's accounts. At that station, too, they had unfortunately had, for two or three years, a superintendent whose health was very feeble, and as directors were generally little disposed to be hard upon an officer under such circumstances, they had allowed matters to go on perhaps longer under his care than they would otherwise have done. However, a change had been made in this respect, and the station at present was in charge of an active, energetic superintendent, under whose management there was no doubt it would become, in proportion to its capacity, as prosperous as any of the others. At Boulogne the company had had a very good season, and also at Havre, and these two stations together showed remarkably well in the report for this year. The other three stations had held their own, which was quite as much as could be expected in the present depressed state of trade on the Continent. The balance of profit, after providing for a dividend and bonus at the same rate as last year, would have been sufficient to pay an additional 1 per cent., leaving then a considerable sum to be added to the reserve; but the board, after maturely considering the matter, thought that as an increase of 1 per cent. had so recently been made, it would be better to let at least another year elapse before making another addition. By this course the general financial position of the company would be improved and strengthened, and the necessity for raising further funds was perfectly set at rest unless any unforseen circumstances should occur, which the directors had no reason to suppose would be the case. It was very satisfactory to know that, after paying the shareholders 10 per cent. for seven years, the profits for the last year were sufficient to allow of a distribution of 11 per cent., which this year might have been raised to 12 per cent. if the directors had deemed it proper to increase the rate, and that, too, without any strain upon the resources of the company in any way. This fact ought to satisfy them as to the state of their affairs, as it showed that the company was now progressing more rapidly than formerly. Thinking, as he could not help doing, that justice had been hardly done to the management of the company, he asked permission to remind the meeting of what had been effected during the last 20

years. It was about 21 years ago that he entered the direction, with the avowed object of improving it, and obtaining greater benefits for the shareholders than they had previously derived from their investment. At that time no dividend was paid; some of the stations were subject to competition; the company was far from being in good odour with the authorities and others with whom they had dealings; the works were becoming dilapidated for want of proper expenditure; the credit of the company was at the lowest, and there was a large amount of unrepresented capital, while shares were sold at 60 per cent. discount. What was the case at the present time? The shares were at 60 per cent. premium; the consumption of gas had quadrupled at the stations, while the consumers shared with the proprietors in the company's prosperity by large reductions in the price of gas; the works were in most excellent order; the authorities and consumers generally were satisfied; the property of the company was secured by exclusive privileges for long terms of years, and at the same time the financial state of the undertaking was all that could be desired. The profits had been generally used by anticipation in the business, and the directors had had to borrow from their bankers to pay the dividends; but, on this occasion, they had money in hand for the purpose. He could assure the meeting that all this had not been effected without the most untiring attention on the part of the directors. They admitted that the company was well officered, but they must take the credit to themselves of having selected efficient men without any patronage or favour, and of educating those men to the performance of the important duties attaching to their office, and making them heartily co-operate, which they did, with the directors in every way. Having made these few observations, he begged to move—"That the report now read be received, adopted, and entered on the minutes."

Mr. FAWCETT seconded the motion.

Mr. HUGGINS wished to say a few words, not in reply to the chairman, but with regard to the financial position of the undertaking. That they were encouraging he admitted, but he could not arrive at precisely the same conclusion the chairman had done. He had taken the opportunity afforded to the shareholders in the previous week of making himself tolerably well acquainted with the affairs of the company, and he must say that, so far as the earnings, in relation to the expenditure, went, they were extremely satisfactory; but he found that the indebtedness of the company assumed a proportion which was not satisfactory in relation to the capital. The capital was £294,000 paid up, and £60,000 uncalled, making an aggregate of £354.000. They had power by their Articles of Association to raise a sum of £75,000 upon debentures; they had also a power which had been exercised in another form, and their indebtedness under the head of "Debentures and mortgages" he found was no less than £116,315, being in excess of their borrowing powers to the extent of £41,350. This was explained in the following manner:—On the issue of the last shares, known as "New shares," 12,000 in number, there was a power given to the directors to anticipate the calls by borrowing money upon them at the time, and that power had been exercised to the extent of £41,350. The power was given by a special resolution passed at a general meeting held on the 13th of August, 1862, and confirmed at a general meeting on the 17th of September following. [The honourable proprietor read the resolution.] At the last annual meeting he asked the chairman as to the calling up of the £60,000 on the new shares, and he was informed, in reply, that this £60,000 was held in reserve in case any contingency might arise. He did not mean to accuse the directors of intending to create a false impression, but he confessed that he went away from the meeting with the conviction that the £60,000 would be available for any purposes for which the company might require it, whereas he found it had been anticipated to the extent of £41,350. By clause 32 of the regulations of the company power was given to the directors to borrow money to the extent of £50,000, but it was provided that for the borrowing of any sum exceeding £20,000 at one time, the sanction of a general meeting of shareholders duly convened for that purpose must be first obtained. Surely, the directors must have overlooked that provision, for certainly he, as a shareholder, had never been invited to attend a meeting for giving such assent. He now found that since the general meeting last year the indebtedness by the company under the head of "Debentures" had increased by no less than £8200, making up the total amount to the sum already mentioned. To his mind this was not a satisfactory proceeding. The indebtedness of the company was wisely arranged in regard to the amount of their capital, and when the new shares were issued they were issued with the distinct understanding that the borrowing powers were only to be exercised for temporary purposes. As it was, the position of the company was really this, that to meet any extraordinary emergency they could only call up £18,650, and to his mind this did not appear at all satisfactory. He found, too, that the reserve-fund of the company was invested in, and was part and parcel of, the stock in trade. In a company like this there were sometimes extraordinary claims which could not be guarded against, and he was pleased to hear that in the Imperial Continental Gas Association the directors kept an amount equal to one year's dividends in hand. He thought the reserve-fund should be something more than a name. He knew the answer he should get would be the stereotyped one, that the company were making 10 per cent. by the employment of this fund, whereas if invested it would only realize 3 per cent. But then he might rejoin that if it was in Consols they knew where to find it when it was wanted. He had thought it right to bring these matters forward, because it was important to know exactly how they stood. The company was growing satisfactorily, and he was free to admit that he was pleased with the simplicity of the accounts. They were in such a form that any one at all acquainted with figures could make himself familiar with them in a few minutes.

The SECRETARY said he thought it better, before the discussion went further, to put the meeting in possession of the facts of the case. In the resolution which the honourable proprietor had quoted it was provided that the board of directors should have further power, from time to time, to borrow and reborrow any sum or sums of money, "in addition to the £75,000 already borrowed," and that such loan should be secured on the property of the company, by any of the instruments and in the manner prescribed in clauses 33 and 34 of the regulations of the company. Now, clause 33 was in these words: "The directors may, as security for any sums borrowed, mortgage all or any of the property of the company, or execute any bond, debentures, promissory notes, or other securities, on behalf of the company." Clause 34 enacted that, "Any mortgage may contain a power of sale." It may also contain such other powers, and be subject to such restrictions as the directors think expedient, and any bond, debenture, promissory note, or other security may be made in such manner, and so far as the law permits may contain such powers and restrictions as the directors think expedient." Then the resolution read by the honourable proprietor went on to say that clause 32 of the regulations of the company, and also the special resolution passed on the 7th of August, 1861, and confirmed on the 18th of September, 1861, to enable the borrowing of a further amount of £25,000, should stand enlarged, amended, and controlled by this resolution; so that clause 32 of the articles was altered to suit the terms of the special resolution which gave power to the directors to borrow to the extent of the uncalled capital.

Mr. HUGGINS: But not to the amount of £20,000.

The SECRETARY said it was with the special view of affecting that part of the clause that the word "enlarged" was inserted in the resolution. With regard to another observation made by the honourable proprietor as to what took place at one of the annual meetings, he thought it necessary to offer a correction. On that occasion the honourable proprietor put a question with the view of ascertaining how far the power had been exercised, and he (the secretary) replied that the directors had called up £5 per share, and that, as regarded the remainder of the capital, it was left entirely to their discretion to make further calls or to raise money on debentures. He had referred to the report of the proceedings at that meeting, and found that that was exactly the answer given.

Mr. BADDELEY thought the proprietors were much indebted to Mr. Huggins for bringing this matter before the meeting, because it was better that it should be settled at once and for ever. What were the facts? The honourable proprietor first of all stated that the directors had exceeded their borrowing powers. Now, the amount really borrowed was £116,350. By the Articles of Association the borrowing powers extended to £50,000, and by the special resolution of the 7th of August, 1861, an additional sum of £25,000 was authorized to be borrowed. These two sums—together £75,000—were mentioned in the special resolution of the 13th of August, 1862, and that resolution proceeded to say that, "in addition to the £75,000 already borrowed, but not exceeding the amount of calls unpaid," the directors should be empowered to borrow further moneys for the use of the company.

Mr. HUGGINS: Temporarily.

Mr. BADDELEY said he saw nothing in the resolution about its being temporary. Therefore, if the amount of calls unpaid was £60,000, the extent of the directors borrowing powers in the whole was £135,000, whereas they had actually only borrowed £116,350. It resolved itself, then, into the question whether it was better for the interests of the company that the directors should make a call, or whether they should exercise their power of borrowing money which could be repaid at any time. As to temporary borrowing, the terms of the resolution were, "that, with a view to make the said increased capital at once available, and as a monetary (not a temporary) provision until the said shares shall be fully paid up, the board of directors shall have further power, from time to time, to borrow and reborrow," &c.; and, in the early part of the resolution, it said that the new capital shall "be subject to the same laws and liabilities, and be entitled to the same rights and privileges, as the present existing shares." By referring to clause 5 of the articles it would be seen that the directors might make such calls upon the shareholders in respect of all moneys unpaid on their shares as they thought fit. They had also full power to borrow on bonds or security of the company's property; and it was, therefore, entirely a matter within their discretion, acting for the best interests of the company, to do which of the two they preferred. As an independent shareholder in the company, he would just call the attention of Mr. Huggins to the 104th clause in the Regulations, because if this agitation about the calling of the remainder of the capital was persevered in it would seriously affect the interests of the company. Supposing the board were to act on the suggestion of the honourable proprietor, and call up the remaining £5 per share on the new shares, the capital would then be fully paid up, and there would be no more borrowing power. By the 104th clause an authority was given to the directors to employ any sum or sums set apart for depreciation and redemption of capital in redeeming the capital of the company, or any part thereof, which redemption might be effected by the purchase of shares, or by the repayment of a portion of the capital paid up *pro rata* to each shareholder, or it might be effected in the following manner —*i. e.*, "At any annual or other general meeting of the company the board of directors may declare the sum then at the disposal of the company for the purpose of redeeming capital, and it shall be competent for such meeting, after such declaration of the board of directors, to appropriate such sum, or any part thereof, in paying off a proportionate number of the shares of the company at par." Now he would ask any shareholder whether he was willing at this moment to take par for his shares, because that was the question. The directors were at liberty to pay off the shares at par, though those shares might have been bought at £5 premium in the market, "and to determine by drawing lots or otherwise the denoting numbers of the shares which shall be so redeemed or paid off. The chairman of the meeting shall then declare the numbers of the shares so to be redeemed, and the board of directors shall, after such meeting, give notice to the holders of such shares that they will be paid off at par within one month." Now he contended that, under these circumstances, if the course advocated by the honourable proprietor were pursued, the value of the company's shares in the market would be depreciated, and, on the other hand, that the directors were exercising a wise discretion in using their powers to borrow money which they could repay at any time instead of making calls.

Mr. WATSON said there was no question between the two gentlemen who had spoken as to the facts relating to the borrowing power of the directors and the amount of money actually raised. The only point was as to whether the power of borrowing should have been exercised for what might be considered a temporary purpose or for a permanency. And the question then arose as to what was temporary and what was permanent, having regard to the interests of the undertaking. He presumed that any capital called up in any way which was to last during the existence of the company's concessions, or to the period when the company would cease to exist, would be considered permanent, whereas any capital which the directors might be in a position to return to those who advanced it during any period less than the concessions would be considered as temporary. If such were the case, the directors, in issuing debentures for 5 or 10 years, had kept strictly within the terms of temporary employment, and the proprietors who had spoken on the subject were practically of one mind.

The motion for the adoption of the report was put, and carried unanimously.

The CHAIRMAN moved—"That a dividend at the rate of 8 per cent. per annum be declared on the old and new shares, the first moiety thereof having been paid on the 1st of February last; that the second moiety be paid on the 2nd of August next, together with a bonus of 6s. per share on the old and 3s. per share on the new shares; the whole out of interest and profits, free of income-tax."

Mr. LEWIS CUBITT seconded the motion, which was put, and carried unanimously.

The retiring directors and auditors were then re-elected, and severally returned thanks.

Mr. BADDELEY renewed the motion made at the last and previous meettings, for increasing the remuneration of the directors. The proprietors, he said, had heard from the chairman some of the benefits which the company had derived from the exertions of the board, and receiving, as they did, the substantial results of the success attending the good management of the undertaking, he thought they were bound to show their appreciation of the

services so rendered. He, therefore, moved—"That the remuneration of the directors be increased to £1200 per annum from the 31st of March last."

Mr. STOKES seconded the motion.

Mr. HUGGINS dissented entirely from the proposal, believing that the present allowance of £1000 to the five directors was an adequate remuneration.

A PROPRIETOR remarked that, notwithstanding the increasing prosperity of the company, there had been no addition made to the remuneration of the directors since 1863, and the amount at present appropriated for the purpose was not equal to that paid by many other companies with less income. He, therefore, supported the motion.

Another PROPRIETOR expressed a hope that it would not be persisted in. He did not admit the principle that, because the company were now enjoying a little prosperity, they should immediately talk of increasing the salaries of the directors. Supposing adverse circumstances should arise—and in a business of this kind it was impossible to say how soon such might be the case—it would be a most unpleasant thing to suggest a reduction.

Mr. WATSON supported the motion, on the ground that the continuous exertions of the directors for many years, to bring the company to a state of prosperity, ought to be suitably acknowledged when, as at present, circumstances permitted. Those gentlemen who were proprietors 20 years ago would remember that it was then doubtful whether the shares of the company were worth keeping. Reference had been made, in the course of these proceedings, to the Imperial Continental Gas Association—a very excellent and well-conducted company. Let them look at the position of this undertaking and of that. Twenty years ago the Imperial Continental Association held concessions in four of the large towns of France—Bordeaux, Lille, Marseilles, and Toulouse. Some few years subsequently, under the new state of affairs induced by the Second Empire, it became necessary to remodel the whole system of gas lighting in that country, and the results were most unfortunate for the Imperial Continental Association. They had lost two of the stations named—Marseilles and Toulouse—which he estimated could not be less than £150,000 out of the pockets of the proprietors. The European Company, with less means at command at the time, had lost nothing; they had retained all their stations, which were all in excellent condition, and all earning a profit. The concessions were not easy to acquire; there were many competitors for them, and but for the constant attention of the members of the board, some of them would never have been obtained. It was quite true they had a most excellent secretary in Mr. Backler, to whose merits he (Mr. Watson) could thoroughly testify, having seen him at work. At the period when he (Mr. Watson) was the engineer of the company, the then chairman acted as the managing director, with a special salary, visited all the stations from time to time, and made himself thoroughly acquainted with their operations. Nothing was beneath his attention, and, by his constant and vigilant supervision, he detected and applied a remedy to everything that was wrong. When he gave up, another member of the board took his place, and up to his death in 1858 he spent several months in every year in France, protecting and advancing the interests of the company. When Mr. Sims was removed by death, it was no longer necessary that the board should be constantly represented on the Continent by one of their number specially paid for the purpose, for by that time Mr. Backler was able to take their place, and do the work hitherto done by one of them, being accompanied by a director twice a year in his quarterly visits to the stations. No one who was without personal experience in the matter could at all appreciate the difficulties and annoyances connected with the negotiations for the renewal of a foreign concession. The labour was enormous, and there was required considerable ability and personal skill. At the time the concessions were renewed there would have been no impropriety if the directors had attempted to gain an increased remuneration, but they knew the position of the company, and abstained from doing so. They not only showed great zeal and ability in their endeavours to place the affairs of the company on a sound basis, but a great deal of personal abnegation in not asking for an additional allowance. Now that the demand was made, not by themselves but by third parties, that services long since rendered should be fittingly recognized, it would be ingratitude on the part of the proprietors generally to withhold their concurrence.

After some further conversation,

The CHAIRMAN said this was a question which the directors would willingly have left to their brother shareholders, but they could not help feeling that there was a certain amount of factiousness on the part of those who opposed the motion. This was the third time the question had been brought forward, and though the directors did not care anything about the matter, they were determined that in one way or other it should be settled that day.

On a show of hands the votes were equal—19 on each side.

Mr. BADDELEY demanded a poll, to which

Mr. HUGGINS objected unless it were postponed till the absent shareholders could be consulted.

Mr. FAWCETT said if the negative vote had been in favour of Mr. Huggins, he doubted whether any objection would have been raised to proceeding with the poll at once.

The SECRETARY stated that, from the creation of the company, a poll, whenever required, had been taken at once.

The poll was then taken, the votes being unanimous in favour of the resolution.

The SECRETARY stated that, independently of the shareholders who had voted, the directors held over 3500 shares, and that many proprietors, holding in the aggregate about 7000 shares, and who could not be present, had expressed their intention, in writing, to support the board if required.

On the motion of Mr. STOKES, a cordial vote of thanks was given to the chairman and directors for their services.

The CHAIRMAN appropriately acknowledged the vote, and the proceedings terminated.

A CHEMIST'S VIEW OF THE SEWAGE QUESTION.

By EDWARD C. C. STANFORD, F.C.S.

[Read before the Glasgow Sewage Association, March 30, 1868.]

Our great object is to consider, first, how to carry away from our houses the excreta of our large population; and, secondly, how to treat it so as to recover for our use its full fertilizing value. The peculiar character of the material to be dealt with renders some vehicle necessary for its transport.

This vehicle may be either solid, liquid, or gaseous; and the secondary proposition depends so entirely upon the vehicle employed for the first, that I intend briefly to review these three several means of conveyance in their chemical aspect. To avoid complication in speaking of either, I shall assume the general adoption of solid vehicles, the cheapest being earth, of liquids water, and of gases air; I shall speak of the three different methods as water, earth, and air carriage, taking water first, as being now most common.

I wish to premise, however, that I regard both the above propositions as essential and necessary, and take as my text Mr. F. O. Ward's celebrated formula—"The rainfall to the river, and the sewage to the soil." No system of sewerage is worthy our consideration which does not give back to the soil that which in our food we have taken from it; and I consider the mere ridding ourselves of a valuable fertilizer, simply on account of difficulty in dealing with it, quite beneath the enlightened spirit of our age.

For convenience of calculation, I take the population of Glasgow at 500,000, and the value of the excreta at 8s. 4d. per head per annum, or £208,333. This is the value given by Professor Way and Mr. Lawes (the highest authorities on this subject), in the third report of the Sewage Commission, and it is now generally adopted by all chemists, each person being reckoned as contributing the value of 12½ lbs. of ammonia per annum.

The total bulk of excreta, making allowance for loss, is estimated at 10 cubic feet per head per annum, and its weight 630 lbs., making an annual total of 5,000,000 cubic feet, weighing 140,625 tons; or, per day, 13,698 cubic feet, or 385 tons.

This, then, is what Glasgow has to remove. The value is 10d. per cubic foot, or 29s. 6d. per ton, and equal (Professor Way) to 16,666 tons of Peruvian guano annually. Of this amount the solids form 1-10th, and the liquids 9-10ths; or 1 cubic foot per head per annum solid, and 9 cubic feet of liquid. The solid and liquid excreta have a relative chemical value of 1 to 6, or 1s. 2d. per head for the former, and 7s. 2d. per head for the latter. The total is thus divided:—

	Tons.				
Annual value of solid excreta. .	14,062 at	41s.	5d.	. .	£29,161
„ „ liquid „ . .	126,563 „	28	3	. .	179,172
					£208,333
The value of the daily removal is .	385 „	29	6	. .	£569

Let us now see how this is proposed to be removed, and what is to be gained in the process.

WATER CARRIAGE.

Taking the amount of water used per head at 5 cubic feet daily, and the rainfall the same, we have the 10 cubic feet diluted with 3650 of water, and the annual material to be removed increased from 500 million cubic feet to 1825 million cubic feet, or 140,625 tons increased to 50,920,401 tons; in other words, we require daily to pump away 140,000 tons of sewage to remove 385 tons of excreta, of which only 38½ tons is solid matter. No wonder we are called upon for lavish expenditure to carry off such a quantity as this, for even if no pumping were required, the cost for sewers must be enormous. And then does it carry it away? and does it utilize it? Suppose an elaborate system of intercepting sewers to convey our sewage to some point several miles down the river; would that meet the evil? Let the experience of London answer this. The metropolitan sewage works are the greatest effort of this kind, and, from the difficulties overcome, are a perfect triumph of our engineering skill, reflecting the highest honour on Mr. Bazalgette; but they cost the princely sum of £4,250,000, or £180,262 per annum, the cost to be paid off in 40 years by rating, at the end of which period the Thames will probably be closed as a port by their deposit, the sewer gases will have proved themselves the most deadly of enemies, and London will stand on a substratum of soil loaded with sewage from infiltration and leakage.

To show that these are not improbable speculations, I append an extract from an able article in the *Pall Mall Gazette* of Feb. 26, 1868, entitled "The Sanitary Dead-Lock":—

"It has now been decided that although Parliament has conferred the right of drainage into the sea and public rivers, this right can only be exercised subject to the condition that no other nuisance is thereby created. 'The notion of collecting all the sewage of a large town,' says Vice-Chancellor Wood, in the case of Blackburn, 'and pouring it into a river without the slightest attempt to clear it of any of its grossest materials, is simply monstrous.' And, again, in the *Attorney-General v. Birmingham Town Council*, the court went as far as to declare that it would not balance the convenience of a town against the legal rights of an individual complainant—the latter must be respected. . . . . The case of the metropolis differs from that of the provincial towns, but has occasioned a similar sanitary dead-lock. The main drainage system discharges the refuse of London into the Thames at Barking and Crossness, comparatively out of the way of population. Although there is, therefore, no sanitary objection to these works, except as regards the towns below London, such as Barking, North Woolwich, Woolwich, Greenwich, Erith, &c., a serious difficulty of another kind has arisen. The mass of matter daily washed down by the sewers of London is so great that, during the few years that have elapsed since the opening of the new sewers, an enormous concentrated deposit of mud, street sweepings, and sewage refuse has accumulated in the bed of the river at Barking and Crossness, and now obstructs the navigation of the river. Last November Mr. Cave stated in the House of Commons that a ship had already stranded on one of the banks thus formed. A chart of the bed of the river at Barking, which has recently been prepared, shows that in the very centre of the channel the soundings have diminished at low water from 21 to 10 feet. . . . Whatever may be the legal aspect of the question, it is quite evident that the navigation of the Thames cannot be allowed to be obstructed even for the sake of draining the metropolis, and that legislative interference will be required if the existing Acts are at all doubtful on this point. Indeed, the whole subject demands the careful consideration of Parliament, in order to release the municipal authorities throughout England from the embarrassing position in which they are now placed. Some way must be discovered of draining our towns at a less sacrifice than is involved in the pollution of streams and blocking up of navigable rivers."

And as to the sewer gases, it appears, according to the evidence collected by the Sewage Commission, quite impossible to get rid of them; one of the engineers examined making this terribly suggestive answer:—"I am afraid we must let out the stink in the middle of the streets."

Now "stink" is not the word, for sewer gases are gases of decomposition, and carry malaria, pestilence, and death with them. Dr. Fergus has related one of many instances in which a number of houses at Leith, previously healthy, have been affected at once with gastric (or typhoid) fever, when connected with the sewers; and showing the constant infiltration of sewage into the soil, and thence into wells; he has also pointed out cases of gastric fever where the long unsuspected cause was the drinking of the water so contaminated.

Mr. Bazalgette states that to ventilate the London sewers by air would cost £460,000 in plant, and £201,480 annually for fuel alone, exclusive of labour and other expenses; he also states that to flush them with water would cost £383,250 annually, even if the water-works could supply the quantity, which is out of the question. The water-closet system is also open to great objection. The best constructed closet is seldom perfectly free from odour; the back rush of deadly gases up the sewers when a high tide covers them, or a strong gale blows into their outlets at low tide, is of enormous force, and will rise through any closet, however well trapped.

Water is a mere carrier, and no disinfectant: its cost, also, from the great quantity required, is very considerable. Mr. Smith has stated the cost here at £40,000 per annum, and, no doubt, if general, £50,000 at least would be required to provide the water and keep up the closets.

The whole system of sewerage by water carriage is recklessly extravagant; it carries the solid and liquid excreta down to our neighbours to rot at their doors, and it leaves us a legacy of deadly gases to remind us that our endeavour to cheat nature has signally failed. As applied to even ridding ourselves of the nuisance, it is the finest effort of "the circumlocution office," and the best illustration of "how not to do it," in our generation.

Engineers have employed an elephant to do the work of a mouse, and the burly brute has trodden down and has laid waste the country.

Then, as to its utilization; here the system almost entirely breaks down. Notwithstanding numerous attempts, no portable manure ever has been, or ever will be, made out of sewage. The chemical value of average sewage, if it could be extracted, is 1d. per ton, taken at 4 grains of ammonia to the gallon; this value is deduced from 93 analyses of Rugby sewage by Professor Way, and now generally admitted. One thousand tons are equal to 12 cwts. of Peruvian guano.

Much has been said here about the solid matter deposited from sewage by standing; let it be clearly understood that it is almost valueless. At Birmingham it accumulates in large quantity, and cannot be sold at 6d. per ton. The reason of this is obvious; almost the entire manurial constituents are soluble in water; and no wonder all companies looking amongst the deposit for their dividends have failed to find them. They are exactly in the position of a ferret, watching patiently one end of a rat-hole while the rat has escaped by the other.

The report of the Sewage Commission gives abundant evidence that even sewage irrigation only pays in certain favourable circumstances. This report is full of information, and represents an enormous amount of labour by its learned authors. They have worked hard to pick out the grain of wheat from the sack of chaff; but we must all admit that it would have saved them much trouble if we had never allowed the admixture.

Irrigation, the only method of utilizing sewage, puts an amount of money value on the ground out of all proportion to the return obtained by the ratepayers. There appears no doubt that the farmer will not give ½d. per ton for it, delivered free of expense. Where gravitation and open carriers can be employed without pumping, its application is remunerative; but in no case is anything like the full money value obtained to the ratepayer. The cost of transport, where the chemical value of a product is only 1d. per ton, is far the more important item.

According to Professor Way's estimate, Glasgow would require 10,000 acres, constantly in use, at 5000 tons sewage per acre per annum, and it would really require 15,000 acres, as one-third must be under root crop.

Now, in a damp climate like ours, what land would take this extra amount of water? and what farmer would ever dream of top-dressing his grass with manure equal to 3 tons of Peruvian guano per acre, if he had to pay the full market value for the manure? Moreover, what could be done with the grass where, as in our case, it would be impossible to make it into hay?

This system of sewage by water carriage is, however, now so general that any means of modifying its evils may be worth our notice.

The sewer traps should all be provided with sieves of charcoal; and I propose to avoid the unsuspected dangers of the sewer gases rising in our present water-closets, to employ a double sieve of wire gauze, containing charcoal, which will slide in just under the seat, and completely close the opening, and which, by a little mechanism, can be made to slide back automatically. Or to enclose the charcoal in a small box with wire gauze sides, and simply place it in the closet. I employ, by preference, seaweed charcoal, the use of which I propose also for the filtration of town sewage, before it is allowed to pass into rivers. It is singularly allied to animal charcoal, which it excels in its porosity, its high oxidizing power, and in the ease with which it admits the rapid passage of thick liquids. The thickest sewage passes through perfectly odourless and colourless. It entirely removes the organic matter from ordinary sewage, and can be used for a considerable length of time, without change. To gain its full power, the sewage should be run into large tanks, which can be used alternately: it is here allowed to deposit for 24 hours. The filtration should be upwards, through a stratum of char, and, when the deposit rises to the char, the whole should be mixed together, and made into manure; the char mixed with the sludge would render it more easy of transport. I do not intend to imply that the char removes the manurial value of the sewage to any great extent, but it renders it innocuous.

Earth Carriage.

This subject has been already brought before you, but as its chemical aspect has not been treated, I shall briefly allude to it. Some misconception appears to have prevailed here as to the disinfecting power of dry earth and ashes; both are absorbents of moisture, and to this extent, and no further, are these disinfectants. This may be easily proved by filtering putrid urine through either of these media; it passes unchanged.

These materials are only, therefore, deodorizers when largely in excess of the fœcal matter to which they are added.

Thus, to take dry clay, the best substance of the kind, it would require three and a half times as much as the excreta, or 17,500,000 cubic feet to be brought into the city, and 22,500,000 cubic feet to be taken out again; and the actual value of this product would be £208,333, or 2¼d. per cubic foot, or 6s. 7d. per ton. Its practical value would, however, be much less, because, on account of the expensive carriage, the value of a manure decreases in inverse geometrical proportion to its strength. It stands to reason, therefore, that if a dry vehicle is to be resorted to, it must be more economical to use some substance which increases, rather than diminishes, the agricultural value of the product, especially if less of it can be employed to do the same work. That substance which, while acting as a deodorizer, also absorbed the most water for a given weight, and added its value to the product, should, theoretically, be the best for this purpose. I find that, while perfectly dry clay only absorbs 45 per cent. of water, dry seaweed char absorbs 147 per cent., and the former becomes a sludgy mud, while the latter can be easily removed.

The use of an absorbent of this kind would, therefore, reduce the amount of material to be brought into the city to less than one-third, or to an amount equal to the excreta to be removed; or 5 million cubic feet brought in, and 10 million cubic feet taken out, annually, the daily removal being 385 tons in, and 770 tons out. This is not more than the present daily removal of ashes, while there would be no greater nuisance, and the value, exclusive of the value of the charcoal, would be about 15s. per ton. Viewed in this light, the dry-closet system presents strong claims to notice, and, in a sanitary sense, its arrangements are perfect.

Air Carriage.

Carriage by atmospheric pressure possesses several advantages afforded by neither of the former systems, both of which add a large bulk of valueless but costly material to the excreta to be removed. Considering the great value and easy application of pneumatic pressure, it is remarkable that so little attention has been directed to it as a means of dealing with excreta; it has been entirely overlooked by those great authorities who have professed to look into all the bearings of this difficult question.

The principal effort in this direction is due to Captain Tiernur. I will briefly describe the main features of this proposition, referring to "The Sewage Question," by Krepp, for further details. Captain Tiernur proposes to place in houses a simple open-pan closet of a particular form, in connexion with a vertical soil-pipe, and so shaped that the total excreta fall at once to the bottom of this pipe in the basement storey of the house, where it collects in a small syphon bend. The soil-pipe is made of earthenware, 14 to 16 inches in diameter, and is continued to the top of the house, where it is open to the air, and covered with a wind-guard for ventilation. The syphon bend and bottom of the pipe are of cast-iron, narrowed from the soil-pipe to a 5-inch cast-iron pipe. This is continued to a central receiver, sunk in the public street. This reservoir has about 20 cubic feet capacity, and allowing 1 cubic foot to every 36 individuals, each serves about 700 persons and a number of houses. Each house has a so-called house-valve, which is accessible from the street, and closes the connexion with the sewage reservoir. This reservoir may be placed in any central position in the public street, sunk under the ground, and surmounted by an ornamental lamp-post, within which the two communicating pipes are concealed. It is of a nearly spherical shape, or quite spherical top and bottom, with cylindrical sides. It receives the drain-pipes from a number of houses, collected in four main branches, which enter it with a slight bend at the top; the house-pipes and main-pipes are all about 5 inches bore, the former entering the latter horizontally at an angle of 30°, and a curve of 2 feet radius. The main-pipes have a gentle downward inclination towards the reservoir, but enter it by a sudden bend upwards. There are two vertical pipes concealed within the lamp-post—one the air-pipe, about 3 inches bore, fixed to the top of the reservoir; and the other the exit soil-pipe, about 6 inches bore, continued nearly to the bottom of the reservoir.

The mode of filling and emptying these receivers is by a "locomotive engine and pneumatic tender," which is drawn by one horse, assisted by the steam power of the engine, to the several reservoirs during the night. The process is simple; the engine works a powerful air-pump, which is placed in connexion with the reservoir and the tender; in about three minutes the gauge indicates a vacuum of about 10 lbs. to the square inch, or about 20 inches barometer pressure, and both are sufficiently exhausted. The several house-valves are then opened, and closed consecutively, and the contents of the syphons instantly shot into the receiver by the downward pressure of air in the soil-pipe, the vertical ventilating-shaft acting like a pea-shooter. When all the house traps are discharged the air-pipe of the receiver is disconnected, the exit soil-pipe connected with the exhausted tender, the contents thus transferred to it, and the whole machine is driven off to the next reservoir; the foul gas from the air-pump is blown into the engine furnace. The tenders have each 100 cubic feet capacity, 10 cubic feet of which is used as a water-tank to the engine. When full these are taken to "decanting houses," where the contents are transferred to barrels. These barrels are 28 inches in diameter, 32 inches long, about 5 cubic feet capacity, and made of strong oak staves bound with iron hoops: they form the stores for the manure, and for its transport, and are to be sold direct to farmers. For applying the contents directly to the soil, which is Captain Tiernur's special object, he proposes plans of ingenious manure ploughs and meadow manurers, which support the barrel and empty its contents at once into the furrow, where it is covered over and kept at once from decomposition. During frost he proposes keeping these barrels in store.

The method of collecting, and particularly of applying, the excreta in these barrels, seems to me a most unnecessary complication. Glasgow would collect at the rate of 2740 barrels a day, and a month's frost would accumulate an explosive store of 82,000 barrels; while in the summer, I fear, the barrels could not be used fast enough to prevent decomposition. There is also this great objection to this method, which applies also to irrigation, that we are compelled to sell our manure constantly to get it off our hands, and by making the farmer take it when he does not want it, and cannot advantageously apply it, we are entirely at his mercy, and must accept his prices; but if we could store it, make it into good manure, and sell it when he wants it, then, and not till then, can we expect to realize its value. If the other parts of this plan work well, a modification would make this feasible.

We have a material to deal with in chemical works which presents some analogy with that under consideration; it must be kept from the air, it cannot be handled, but it is nearly double the weight of the excreta, and very corrosive. Yet this is lifted without any difficulty to great heights, and carried long distances, with no trouble and little expense, by atmospheric pressure; and could not the excreta be dealt with in the same way? The drain-pipes from the houses should be led into iron reservoirs, the size and number of these to be determined; the total daily removal being only 13,700 cubic feet, twelve cylindrical boilers, with egg-shaped ends, about 10 feet by 10 feet, by 15 to 20 feet long, sunk vertically, would be sufficient for Glasgow. It might, however, be advisable to have smaller vessels in larger number; that is a matter of detail.

These reservoirs are all to be connected, by a small air-pipe, to one or more central pumping-stations, where a powerful air-pump is fixed; each also to be furnished with an exit soil-pipe, passing to the bottom, and continued up into a main-pipe leading to one or two manure works situated some miles out of town.

This would, then, be the process of removal; at a fixed hour at night the air-pump would be set to exhaust a large iron reservoir at the pumping-station, and communicating with the air-pipes attached to the soil reservoirs. Two men for each district would then be sent round, and, opening the air-pipe valve, would place each receiver in connexion with the exhausting-pump, and then open consecutively the house-valves, by which means the soil-pipes would be nightly discharged, and the whole closet ventilated by a powerful blast of air. This is one operation. During the day, at a certain hour, the engine and air-pump would be reversed, and pump air into the air-vessel at the pumping-station; the several soil reservoirs would then be placed in connexion, and the contents lifted by the atmospheric pressure away to the manure-works.

When we consider that a pressure of 50 lbs. on the square inch can be thus easily applied, there is merely the friction and some little weight to overcome; the plan seems quite practicable, and is at any rate worth a trial. The piping required would be an arterial system of small cast-iron piping; its cost, compared to sewers, would be little, and the cost for pumping must be insignnificant, compared to that for lifting sewage in such enormous quantities.

The Abbey Mills pumping-station has eight engines, 142-horse power each, or 1136-horse power; and these lift 15,000 cubic feet a minute 86 feet

high. We have only to lift 385 tons, or 13,700 cubic feet, and the whole day's produce of Glasgow may be contained in a tank 30 feet square and 16 feet deep. These pumps, therefore, would do our day's work in fifty-four seconds.

When engineers talk of intercepting sewers for our sewage, they mean immense culverts of brick, which leak in all directions, and are full of noxious gases, to carry off 137,000 tons of sewage a day, containing 385 tons, or 1-355th of excreta, and only 38½ tons, or 1-3550th of its weight of solid excreta. My notion of a true intercepting sewer is a perfectly tight and cheap cast-iron pipe, which will really intercept this excreta, and deal with it alone. It is, to all intents and purposes, a fluid, and subject to all the laws of fluid pressure; to add 355 times its weight of water to *make it fluid*, is not only "carting coals to Newcastle," but it is paying very heavily for the pleasure of doing so.

Engineers should consider the possibility of removing, without nuisance, the excreta, as it is, from where it is to where it should be; because, if it can be so delivered, the further disposal of it can be safely left to chemists, who may then be fairly asked to turn it to account. We have not hitherto had a fair chance; engineers are allowed to mix the excreta with much water, and then to turn round and ask chemists to separate it again, forgetting that the *reductio ad absurdum* is *not* a chemical process.

Dickens, in his preface to the last edition of "Pickwick Papers," after referring to the great improvements which have taken place since he wrote the work, ventures a hope that "it may some day be discovered that the universal diffusion of common decency and health is as much the right of the poorest of the poor as it is indispensable to the safety of the rich and of the state; that a few petty boards and bodies—less than drops in the great ocean of humanity which roars around them—are not for ever to let loose fever and consumption on God's creatures at their will, or always to keep their jobbing little fiddles going for a dance of death."—*Chemical News.*

(To be continued.)

BOMBAY GAS COMPANY, LIMITED.

The Seventh Ordinary Meeting of the Shareholders of this Company was held at the City Terminus Hotel, Cannon Street, London, on Wednesday, July 7—DANIEL THOMAS EVANS, Esq., in the chair.

The SECRETARY (Mr. W. Marshall) having read the notice convening the meeting and the minutes of the last meeting, which were approved, the seal of the company was affixed to the register of shareholders, and the following report and statements of accounts were submitted:—

Your directors, in meeting the shareholders at the seventh ordinary meeting of the company, have pleasure in presenting a statement of accounts made up to the 31st of December last, and duly audited, with a report of the progress effected during the year.

Your directors have to report that the operations during the year show a considerable improvement. In the report for last year the number of lights, on the 28th of April, 1868, was stated as follows:—Private consumers, 10,914 lights; public lamps, 1734; number of lights in course of fitting, 376; total number of lights 13,024. On 30th of April last (the date of our most recent advices) there were burning—Private consumers, 11,820 lights; public lamps, 1774; number of lights in course of fitting, 10; total number of lights, 13,604. From this it will be seen there is an increase in the private lights of 906; of public lights, 40; total increase of lights, 946. In 1867 the gas made was 51,000,000 cubic feet, and the gas sold 46,000,000. In 1868 the gas made was 53,816,000 cubic feet, and the gas sold 48,024,000.

But it is by reference to the accounts that the safest indications of the advance of the company is obtainable. Almost every item in the profit and loss account—of charges on the one side and of returns on the other—is in favour of the company. Not to go fully into details (as they are before the shareholders), it may be mentioned that the coal carbonized in 1867 cost £18,457; coal carbonized in 1868 cost £17,177; showing a decrease of £1280; the gas and meter rental and lamplighting was, in 1867, £31,202; in 1868, £35,410; showing an increase of profit, on the items of coal and gas and meter rental, of £5488.

It will be remembered that the profit of last year was swollen by the sum of £4488, realized by coal, &c. This year the revenue derives no such assistance. It is, therefore, the more gratifying to the directors, and should be more assuring to the shareholders, to find that the profits this year will allow of a dividend equal to that of last year, and this notwithstanding the fact that the reserve-fund (depreciation) which now amounts to £3745 9s. 1d., is credited with a larger sum than last year, the amounts being £1000 in 1867, and, in round numbers, £1150 in 1868.

The general revenue account shows a balance, after payment of the interim dividend, available for distribution of £6767 4s. 4d. Out of this the board recommend a dividend of 2 5-6ths per cent., free of income-tax, payable on the 12th of July, making, with the interim dividend of 1¾ per cent., paid on the 1st of January last, a total dividend of 4½ per cent. for the year.

As regards the state of the works, mains, and services, the resident engineer writes as follows:—

"Since my last report I have much pleasure to state that there has been, and continues to be, a steady increase in private consumption, amongst which may be mentioned—Messrs. Treacher and Co., the Arthur Crawford Markets, the Bombay and Baroda Railway Station, the St. Xavier's College, the Elphinstone College, and the new wings of the J. J. Hospital. And we are now in negotiation for lighting the Oriental Spinning Mills, the Manockjee Petit Spinning Mills, the Sailors Home, the Masonic Hall, the Jews Synagogue, and the extension to Colaba. Many important buildings, such as the New Secretariate, the High Court, the New Post-Office, Apollo Bunder, and the New Mechanics Institution, are now in course of construction, and will each, no doubt, take a supply of gas.

"With the exception of the crowns of the gasholders,* I may state that the whole of the works and mains are in a state of thorough repair. Our leakage for the past month is 10·69 per cent., while the average of last year's leakage was 10·61 per cent."

His Excellency the Governor of Bombay, and several influential natives who have employed the company for grand illuminations, have expressed, in writing, their high appreciation of the manner in which the lighting is carried out, and the superior quality of the gas supplied. The natives are gradually learning to understand the advantages of gas, as proved by the increase of private lights. Application has been made for the extension of the mains to Colaba, and steps have been taken in that direction. If carried out, as your directors have reason to believe they will be, a considerable extension of consumption must follow. The cost of freights and prices of coal have fallen, and the exchanges, on which a loss of no less than £741 19s. 9d. was unavoidably incurred in the past year, have been much more favourable in 1869.

The directors have to report to the shareholders that they have received the account of their engineer, Mr. Hawksley, and are well satisfied with his moderate charges, and the liberal manner in which he has treated the company in this respect. The balance of £1600 is chargeable to capital, but it does not appear in the year's accounts.

The board have to express their regret that they have lost, through the death of Mr. Young, a zealous and useful colleague. They have elected in his place Mr. Henry Palfrey Stephenson, who, with Mr. C. F. Collier, now retires from office, and both, being eligible, offer themselves for re-election.

* The manager reports that "the tops of the gasholders are now perfectly tight."

GENERAL BALANCE, *for the Year ended December* 31, 1868.

Dr.				*Cr.*			
To Capital authorized, viz.:— (50,000 shares, at £5 each—£250,000.)				By Construction			£160,759 3 5
40,000 shares, on which £5 per share have been called up and paid	£200,000 0 0			Interest paid to shareholders	£23,864 9 9		
10,000 shares, on which £4 per share have been called up	£40,000 0 0			Less unclaimed	17 7 0		
Less calls unpaid	271 0 0					23,847 2 9	
	£39,729 0 0			Amount due to the company		14,559 9 3	
		£239,729 0 0		Goods *in transitu*		4,906 9 5	
Amount owing by the company in London	£1,821 12 0			Stocks, viz.:—			
Ditto ditto in Bombay	704 14 3			Chandeliers, brackets, &c.		10,082 11 8	
		2,526 6 3		Brass and iron fittings, and tubing		17,943 11 1	
Dividend		3,833 6 8		New works—materials		1,018 1 4	
Interest		2,428 1 3		Mains, services, and meters		11,141 16 1	
Depreciation-fund		3,745 9 1		Coal		4,440 0 0	
Balance from general revenue account		6,767 4 4		Coke		15 12 0	
				Tar		742 3 2	
				Lime, oxide, fire materials, &c.		1,972 7 1	
				Cash at bankers and in hand	£3,080 1 7		
				Bills receivable	4,460 18 9		
						7,541 0 4	
		£259,029 7 7					£259,029 7 7

PROFIT AND LOSS ACCOUNT.

Dr.				*Cr.*			
To Coal carbonized			£17,177 10 1	By Gas and meter rental			£35,410 2 3
Wages			1,982 13 8	Coke			4,104 6 10
Purifying			692 0 1	Tar			1,576 3 10
Maintenance of retorts			665 3 2	Fittings			1,042 6 0
Trade and general charges, viz.:—				Incidental receipts			84 4 1
Tools	£204 5 7						
Repairs	253 0 3						
Yard	460 0 7						
Distribution	1,093 11 4						
General charges	795 8 11						
		2,716 6 8					
Salaries and collectors commission		3,586 3 4					
Rents, rates, and taxes		1,165 12 0					
Passages		617 13 0					
Loss on exchange		741 19 9					
Interest		274 7 1					
Directors and auditors remuneration		852 10 0					
Bad debts and allowances		140 12 3					
Amount carried to depreciation-fund		1,142 10 4					
Net profit for the year		10,462 1 7					
		£42,217 3 0					£42,217 3 0

GENERAL REVENUE ACCOUNT.

Dr.			*Cr.*		
To Dividend of 2 per cent. (making 4½ per cent. for the year ended December 31, 1867), declared June 26, and paid July 1, 1868		£4,600 0 0	By Balance unappropriated, December 31, 1867		£4,738 9 5
Interim dividend of 1¾ per cent., for the half year ended June 30, 1868, declared December 3, 1868, and paid January 1, 1869		3,833 6 8	Net profit for the year ended December 31, 1868, brought from profit and loss account		10,462 1 7
Balance available for dividend		6,767 4 4			
		£15,200 11 0			£15 200 11 0

The CHAIRMAN: Gentlemen, it will be in your recollection, I have no doubt, that, at the half-yearly meeting held in December, 1868, when I last had the honour of addressing you, our accounts were not made up, and we were not in a position accurately to define the amount of our profits. We then declared a dividend within what we were certain those profits would justify, and I told you that we thought we saw our way to a total dividend in the year of 4 per cent., and probably something more. Upon the present occasion it is very gratifying to us, the directors, and we think it will be acceptable to you, to find that what I then stated has, upon the making up of the accounts, been more than substantiated. The accounts have turned out more favourable than we anticipated, and after making due provision, as advised, for the depreciation-fund, we are enabled to declare a dividend of 4½ per cent., and this notwithstanding the prices of coal and freights have been very heavy during the year under review; the cost of coal into our retorts, as I shall presently show, being, on an average throughout the year, no less than £2 14s. per ton. Referring to the accounts, you will find in the general balance-sheet that the "Construction account" stands at £160,759, which is an increase of £6600 upon the previous year. That increase is

partly accounted for by the purchase of one acre of land, for the enlargement of the area of the works, at a cost of £1108. I think it is certainly as far back as 1866 that we had the opportunity of purchasing this land, and we deemed it advisable to do so; but, in consequence of some difficulty as to the title, we did not complete the purchase until recently. It was very desirable that the land should be acquired, not so much for the sake of our immediate wants as for our probable future necessities, when, if deferred, we might have had to pay a considerably higher price for it. The materials used in construction during the year cost £1800; new mains about £1000, and new services about £1200; and these items together nearly make up the sum by which the construction account has been increased. If you turn to the amount due to the company you will find that it has increased from £12,249, at which it stood last year, to £14,559, being an addition of £2310. Now of this the large sum of £7617 was arrears due from the Municipality, being an increase in this respect of £1504. The balance of £816 is the increase of outstanding accounts with private consumers. I do not think this is an unreasonable increase, regard being had to the enlarged gas-rental. In point of fact the increase is more apparent than real, as I shall presently show. In 1866 the outstandings—*i. e.*, the arrears of gas-rental and other things—were equal to 4½ months income, in 1867 to 3½ months income, and in 1868 to 3 months income. They have, therefore, in truth, been reduced, when viewed in relation to the increased rental of the company. The next item is "Goods *in transitu*," which shows a large reduction, there being less goods afloat this year than last. The stocks in hand in 1867 amounted to £49,229, and in 1868 to £47,356, showing a decrease of £1873. During the year 1868 the "Fittings sold" amounted to £5570, and the receipts for fittings labour were £1894, making a total of £7464. On the other side, new fittings and materials cost £4518, and fittings wages £1903—total, £6421, which deducted from the £7464 leaves the profits of the fittings business, as shown in the accounts, £1043. Now I may say here, parenthetically, I think it is not unsatisfactory that our profits under this head should amount to £1043, for this reason, that we have reduced the cost of fittings to a minimum for the best of all purposes—we found that the cost of fittings was a considerable obstacle to the consumption of gas. Turning to the debit side, you will observe that the amount owing by the company in 1867 was £13,616 in London, and £1060 in Bombay: total, £14,676. In 1868 the amount owing by the company in London was £1821, and in Bombay £704: total, £2525. Now, the difference is mainly due to a call of £10,000—*i. e.*, £1 per share upon the fourth issue—made and paid since the ordinary meeting in 1867. Before we made that call we were crippled for working capital; we made the call to meet that difficulty, and the advantage is seen in the fact that now we owe only £2525, as against £14,676 in the former year. Our depreciation-fund has increased to £3745. In 1867 it stood at £2602, and we have added to it £1142, as against £1000 in 1867. If you turn to the debit side of the profit and loss account, you will find that whereas the coal carbonized in 1867 cost £18,457, last year it only cost £17,177; showing a difference in favour of the company of £1280, and that, too, notwithstanding the gas made in 1860 was nearly 3 million cubic feet in excess of that made in 1867. The cost of coal per ton in 1867 was £3 1s. 6d.; last year it was £2 14s.; and this, broadly speaking, will account to a very material extent for the fact that we are enabled to make a dividend in the year of 4½ per cent. Wages and maintenance of retorts in 1868 cost about £300 less than in the previous year. The purifying has been a matter of considerable difficulty with us in Bombay, and the cost has been something enormous. We have reduced the expenditure, and hope still more to reduce it. In 1867 the cost was £1152; in 1868 it was £692, showing a reduction of £460; and I am happy to say that reduction is not only being maintained, but will be increased. The cost of distribution in 1867 was £1692; last year it was £1003, showing a difference in favour of the latter of £689. I should add that in 1868 the lamplighters wages were not included, they appearing under the head of general wages. The item of "Salaries and collectors commission" in 1867 amounted to £3703; last year they were £3586, showing a difference of £116 in our favour. "Rents, rates, and taxes," in 1867, were £1444; last year they were £1165, showing a difference in favour of the company of £379. The "Loss on exchange," as I told you at the last meeting, has for the last two years been an item steadily adverse to us; I am happy to say there has now been a change in our favour. In 1867 the loss was £817; last year it was £741, showing a difference in favour of the company of £76. In 1868 the sum remitted to the company from Bombay was £15,000, and in that year we lost as much as 6 per cent. on some of those remittances by adverse exchanges. All our remittances this year are advantageous. We have received £12,000 since the beginning of the year, at a rate of exchange in our favour of nearly £100. "Bad debts and allowances," in 1867, amounted to £195; last year they were £140, showing a balance in favour of the company of £54. Now I think, if you look at our large gas-rental, and the large sums we receive for residual products, you will be of opinion that such an amount is not excessive. On the other side of the profit and loss account we come to a very interesting feature—the gas and meter rental, which in 1867 stood at £31,202 and in 1868 realized £35,410, being an increase in favour of the last year of £4208. If you add to that the difference in the cost of the coal carbonized in 1868, as contrasted with 1867, there is a total increase of £5488. As regards residual products, I may say that coke in 1867 brought £4501, and in 1868 £4104, being a difference against us of £397, which is more than counterbalanced by the profit realized by our tar. I am sorry to say we cannot utilize our ammoniacal liquor, there being no chemical works in Bombay, and it is not worth our while to manufacture sulphate of ammonia. Our tar in 1867 realized £699; in 1868, £1576, or nearly £1000 additional, which is a set-off against the deficiency arising from the sale of coke. I have mentioned that we deemed it expedient to reduce the cost of fittings, so as to extend the sale of gas. Our profits from fittings, in 1867, were £601; in 1868 they were £1042, being an increase in the latter year of £441. The item of "Incidental receipts" shows an apparent deficiency, when compared with the previous year, of £2398, and it is accounted for in this way: Last year the receipts from lamplighting were included in this item; this year they are inserted under the head of "Gas and meter rental." I may say we have altered the form of accounts in some particulars, on the suggestion of Mr. H. P. Stephenson. The net profit for the year is £10,462 1s. 7d., as contrasted with £8268 10s. 7d. in 1867, being a balance in our favour of £2193 11s. Now, you will remember that the profit of 1867 was swollen by nearly £5000 (£4488), realized mainly by the fortunate sale of coal through the breaking out of the Abyssinian war. Last year we had no such help—we had only the legitimate profits of our trade. The increase of net profit in 1868 over 1867 is not less than £6681 13s. 1d., or an improvement of 88 per cent. The balance available for dividend is £6767 4s. 3d. In 1867 the quantity of gas made was 51 million cubic feet, and the sale was 46 millions. In 1868 the quantity made was 53,816,000 cubic feet, and the sale 48,024,000, being an increase of 2,024,000 cubic feet. I may add that our leakage during both periods was about the same. The increase of lights in the twelve months up to the 30th of April, the date of our latest advices, was 946, being 906 private and 40 public lights. To recapitulate—we have produced and sold more gas, at a reduced cost for coal; the purification and distribution have cost much less; wages, maintenance of retorts, much less; salaries, commission, rents, rates, and taxes, much less. Then, again, assisting us, on the credit side of the account, we have the gas and meter rental and profit by coal (consuming less than last year), £5488; a considerable increase in the tar and fittings account, while the exchange shows a profit on the transactions of this year, and our bad debts are less than before. I now come to speak of the prospects of the company for the present year, and I will first trouble you by reading the extract from Mr. Proud's advice. [The chairman, having read the extract embodied in the directors report, proceeded:] You will remember, gentlemen, that in previous addresses from this chair I have communicated the fact that we have had more or less difficulty with the Municipality of Bombay. Ever since we have been a company we have had a most trying time of it, and have had to exercise great caution and discretion, and I may say great forbearance in our communications with them. Having had some experience and given much consideration to the question, we thought we were in circumstances to make a proposal for lighting the city of Bombay for a term of years, which, if accepted, would enable us to go on comfortably. Negotiations commenced. They made an offer to us of a contract for seven years, under date of the 15th of September, 1868, at the rate of 5½ rupees (11s.) per 1000 cubic feet, the Municipality to pay one quarter of the cost of all new mains, and the number of public lamps to be increased to 2500 within eighteen months. Well, gentlemen, we took the advice of our able engineer, Mr. Hawksley, upon the question, and he made a report to us, which I must say, in justice and candour to him, carried conviction to our minds that we could not accept a contract on those terms. We, therefore, declined their offer, and made a proposition of our own, which they, in their turn, refused. It is due to my friend, Mr. Stephenson, whom we elected to a seat at the board, in deference to the suggestions made by some of the shareholders at the last half-yearly meeting, that he should have the credit of the next step taken by us if it should prove, as I have hopes it will, beneficial to the company. He induced us to offer to the Municipality an amended contract, which was sent out. Immediately after that (the letters crossing on the seas) came a notice from the Municipality to expunge 600 lights, and they advertised for contracts to light the streets with kerosine. I am happy, however, to say that we have received a telegram informing us that as soon as our new offer arrived at Bombay the Municipality resolved to negotiate with us on the basis of that offer, and we have, therefore, every reason to suppose that the order to extinguish the public lamps has been suspended.* We have supplied the Municipality at 7 rupees per 1000 cubic feet, the consumption being registered by meter indication; and if this contract be carried out, which I have no doubt it will be, all our difficulties with the Municipality will be at an end, and we shall have plain sailing in the future. I may say, as I go along, that it might have embarrassed us very materially if the hostility with the Municipality had continued, for it might have led to the introduction and use of kerosine. On every ground, therefore, it was desirable that the disputed points between us should be settled as speedily as possible. Gentlemen, I have very few more words to add; I will only say that I think our prospects for the future are more encouraging and assuring than at any period during the history of our company. The price of coal and freight, though still large, is certainly lower than it has been for the last three years. We are now placing coal within the works, from this country and Australia, at about two guineas a ton, and I trust the effect of this diminution of cost will be seen in our next year's accounts. Our cost of production is less than formerly, and I trust it will be still further reduced. We are sending out a gentleman as manager, in whom we have every confidence; we are exercising the most rigid and close economy in the management of the company's affairs, and we hope soon—and I think it is a necessary corollary of the contract with the corporation—to reduce the price of gas to private consumers, which I hope will add not only to our popularity, but also to our prosperity in Bombay. I ought to mention that two gentlemen have given notice that they intend to offer themselves for seats at the board—viz., Major-General Rigby and Mr. Robert Clarke. With reference to this matter, I should say that I understand these gentlemen do not propose to contest the seat of either of the retiring directors, who offer themselves for re-election, but they are candidates with the view of making seven directors on the board. I am instructed by the present directors to say that, having considered the question very fully, they are decidedly of opinion that any addition to the existing number would be inexpedient. With these remarks, I beg to move—"That the report and statement of accounts which have been circulated among the shareholders be received and adopted, and that a dividend at the rate of 2½ per cent. be now declared, making, with the interim dividend of 1¾ per cent. paid on the 1st of January last, a total dividend of 4½ per cent. for the year, free of income-tax; that such dividend be payable on the 12th of July to the shareholders on the London register, and to those on the Bombay register three days after the arrival of the outward mail on the 9th."

Major Stuart seconded the motion.

Mr. Stephenson Clark thought it would be satisfactory to the shareholders to hear from Mr. H. P. Stephenson, the newly elected director, some explanation of the affairs of the company.

Mr. Harrison was of opinion that the address of the chairman embraced every point upon which it was possible for Mr. Stephenson to give any information. It was an irregular proceeding to call upon an individual director to make a statement, and could only result in a waste of time.

The Chairman said he was perfectly competent to answer any question upon the affairs of the company himself, other than an engineering question, and willing to furnish every information desired.

A Shareholder remarked that, as Mr. Hawksley was present, any engineering question should be addressed to him.

Mr. Stephenson said he was prepared to adopt whatever course in the matter the meeting might decide on.

Mr. Rowsell said it was a very common thing, when "fresh blood" was infused into a direction, for the shareholders to seek information from the new director, and it was always a satisfaction when such director was found to be in harmony with his colleagues at the board.

The Chairman said he should not stand upon etiquette, nor feel it any compromise of his own dignity if he thought it was the general desire of the meeting to hear Mr. Stephenson. He was quite sure that gentleman would make no remarks disparaging to the old directors, and he might say, though in his presence, that he considered the accession of Mr. Stephenson to the board was an advantage to the company.

Mr. Nodes was of opinion that all communications should be made through the chairman.

* By a letter received since the meeting, we are informed that the order to discontinue 600 lights has been suspended, and the public lighting goes on as before.

Mr. LYSLEY expressed the same opinion, and said it was altogether irregular to ask a new director to make a statement of his views, which would amount to nothing at all unless they were in opposition to those which had been already expressed by the chairman. He (Mr. Lysley) was a director in two metropolitan gas companies, and a shareholder in many others, and he was bound, as a frequent attendant at meetings of this kind, to say that it was not often his lot to hear the working of an undertaking detailed with the candour, clearness, and ability with which the chairman had just favoured them. From the speech of the chairman, he felt sure that the meeting was in full possession of the state of the company's affairs, and it would be invidious for another director to be called upon to express his individual views after what they had heard.

The CHAIRMAN again stated that he was quite prepared to answer any questions, and he reminded the shareholders that the question before the meeting was the adoption of the report.

Mr. HARRISON said he was rejoiced to hear the statement of the chairman with reference to the anticipated arrangements with the Municipality, and he hoped it would issue in the establishment of an altogether better state of relationship between them and the company. He had heard from Bombay that things were going on as badly as possible—that the authorities had extinguished 800 lights, and were about to adopt kerosine, which it was estimated would cost about half the price of gas. He trusted that in renewing the contract the directors had not inserted a price which would be unremunerative. He was afraid there had been mismanagement in the company's affairs at Bombay, which had led to the past disagreements, and he would ask the attention of the directors particularly to a consideration of whether things had been conducted there as they ought to have been. The shareholders had every confidence in the gentlemen who managed the business of the company in England; but the practical working of affairs was in Bombay, and it was of vital consequence that they should have officials there who were men of good ability and of the highest integrity. As he had already remarked, he hoped the directors had secured a remunerative price in the new contract, because the cost of making gas was so great abroad that the company could not afford a loss upon the public lighting. The next thing as affecting their well-being was the price of coal; it was the very life blood of the concern, for if they did not buy coal well they could not sell gas cheaply, and therefore the utmost attention of the board should be directed to obtain regular contracts for coals at the lowest possible price. He had taken some pains to ascertain the price current at Bombay during the last year, and he found that the highest quotation was 24½ rupees. But the company's coals cost them on the average, during that period, 54s. per ton; therefore he thought they had been paying too much, and that they ought to have obtained them at 2½ or 3 rupees lower. At the present time, he believed, coals were extremely low; the average price all this year had been about 33s. It was, therefore, an advantageous time to make contracts, and he thought the directors should put the supply up to public competition for a given period. They would then never be driven into a corner, and have to pay an extravagant price in consequence. Looking at the accounts, the first thing that struck him was the frightful item in the capital account of upwards of £28,000 for chandeliers, brackets, brass and iron fittings, and tubing. To his mind it appeared an act of great imprudence ever to have laid out such an enormous sum as this in a country where everything metallic must deteriorate, and in the course of three or four years be not worth half its original cost. This item amounted to 17½ per cent. on the cost of construction of all the works, and was altogether a most unreasonable outlay. For mains, services, and meters the whole expenditure was only £11,141, and therefore it was preposterous to tie up so large a sum as £28,000 in chandeliers and fittings. With respect to the mains, services, and meters, he would remark that the two former were things done with.

The CHAIRMAN: No, I hope not. We are extending our mains to Colaba, a distance of three miles, where we hope for a large consumption.

Mr. HARRISON was only about to observe that he thought the meter account should be entirely separated from mains and services, as they were things hired out, and upon which a rental was received. He hoped by next meeting a valuation would be made of the stocks, so that the shareholders might have some idea of the real worth of those things, upon which £28,000 had been expended. If the matters he had referred to were carefully looked after, he felt confidence that, though hitherto the dividends of the company had been low for the time the works had been in operation, there was a good prospect for the undertaking in the future.

Major-General RIGBY wished to know how the coal contracts were made, and whether it was true that they were given to a gentleman who was a near relative of one of the directors. He also wished to know whether the depreciation-fund really existed, or whether it was only on paper; and, if it existed, where it was invested. He thought the amount due from private consumers was unnecessarily large, as it was the custom in Bombay for all accounts to be settled monthly. If this were strictly enforced by the directors, the chances of making bad debts would be very small. He was of opinion that the shareholders should take some action in reference to the chandeliers and fittings. They stood at the same amount which they did two years ago; whereas, in a climate like that of Bombay—hot and damp—the chances were that they had deteriorated to one-half of their original value. There had been very little said at any time by the directors as to at whose suggestion they were bought, and how the contract was given for the outlay of this enormous amount of capital. Then again, it appeared to him that any sum recovered from the £28,000 by sales of chandeliers and fittings, instead of being replaced to capital, was being carried to profit and loss account, so that capital would always stand charged with this large item. The meeting had had laid before it a long array of figures to prove how prosperous the company were, still the fact remained that, after seven years, for five years of which they had paid dividend out of capital, the number of lights in course of fitting at the date of the last advices was 10! and that, too, in a city of a million inhabitants. In the report two years ago the directors said: "The average rate of increase of private lights (from which the main income of the company is derived) may be fairly estimated at 150 per week, or 7800 per annum;" whereas the actual increase last year was 906, so that there was not much room for congratulation as to the rate of progress. As to those places referred to in the report of the manager as having been recently lighted, he could only say that one gin palace in London would consume more gas than the whole, the majority of them not lighting up at night at all, so that here again the company were not making any extraordinary progress. With reference to the board, he remarked that, though vacancies had occurred, the directors continued to draw the same allowance for their services; and he thought they ought either to consent to a reduced scale of remuneration, or else that the number of directors should be increased. He was in favour of the latter course, and desired to see some one added to the board who was connected with a business house in Bombay. There was a very unfavourable impression abroad as to the way in which the company's coal contracts were made, and a gentleman recently said to him, "How can you expect the company to succeed when you know the way in which the coal contracts are made?"

Major SUART: We have never had any.

Major-General RIGBY: Well, the way in which the coal is bought. I hope we shall come to a decision that no shareholder shall hold contracts unless he has obtained them by public competition.

Mr. STEPHENSON CLARK wished it to be understood that Mr. H. P. Stephenson was no relative of his. He thought if Major-General Rigby were a commercial man, he would be a little more careful in the remarks he made.

Mr. LYSLEY said there had been constant reference to the price of coals, but he was surprised that no allusion had been made to freights, which cost double the amount of coal.

Mr. STEPHENSON: Five times as much.

Mr. LYSLEY said the utmost saving in the cost of coal would, under favourable circumstances, only amount to a shilling or two in a ton, whereas the question of obtaining satisfactory freights was a very large and important matter, and to choose the right time and the right people was a main point for the consideration of the directors.

Mr. ROWSELL asked if there was a local audit of the company's accounts. He regarded that as a material point, and he thought also it would be wise to separate the manufacturing account from the London account, as was generally done in foreign gas companies. A remark had been made that there was no gentleman on the board connected with business in Bombay. For his own part he thought the present board were quite as competent as any body of directors could be. The business of a gas company was not a mystery, and he had no doubt it was perfectly well managed by the gentlemen at the table.

Mr. LAMBERT said it appeared to him that the directors were recommending a rather larger dividend than the business had earned, which was a very unwise policy. The net earnings were £10,462, and a dividend of 4½ per cent. amounted to £10,800, so that it was necessary to trench upon the capital to the extent of about £340. It might be said that a portion of the capital only came into dividend for a portion of the year; but taking the dividend upon £230,000, which was the capital at the last meeting, it would come within £100 of the net profits to pay 4½ per cent., and the £100 would not pay dividend upon the capital recently called up, whereas in a company like this the directors ought to carry over a balance.

The CHAIRMAN said he proposed to answer the last shareholder first. Mr. Lambert did not bear in mind the circumstance that the £10,000 last called up only bore interest for four months in the year, and, taking that into account, it would be found that there was a margin in their favour. All they had to find was £6666 13s. 4d., whereas the earnings available for dividend were £6767, showing an overplus of £100.

Mr. LAMBERT: You had a balance of £100 carried over last year, and you use that.

The CHAIRMAN: Yes; and we carry over a larger amount to depreciation this year than last.

Mr. HARRISON said £1142 was carried this year to depreciation. He understood the rule in this country was to carry 1 per cent. to that fund, and on this principle the sum written off should be £1600. This was the more important as in Bombay the actual depreciation of plant was much greater than here.

The CHAIRMAN, replying to previous speakers, said he believed the contract with the Municipality would be remunerative. He was obliged in candour to say that the management of the company's affairs in Bombay had been unsatisfactory to the directors, and they had made material changes with respect to it.

A PROPRIETOR inquired whether the new manager would have the entire supervision of all matters at Bombay.

The CHAIRMAN said he would; he was made responsible for the whole. But, with regard to money matters, there was a divided responsibility with the financial secretary. One could not draw a cheque without the other, and the manager had no power to displace the financial secretary and treasurer without instructions from the board.

Mr. LYSLEY asked whether the financial secretary was the auditor also.

The CHAIRMAN said there was no auditor in Bombay. The accounts came over to England monthly, vouched by the general manager.

Mr. LYSLEY urged the desirableness of appointing some person of trust, probity, and ability to examine the accounts at Bombay.

The CHAIRMAN said it was a matter which the board would take into their serious consideration.

A SHAREHOLDER thought if there was a local board in Bombay it would give the natives confidence in the company, and the number of directors on this side might then be reduced to three.

Mr. HARRISON was opposed to the suggestion, and said if it were adopted the two boards would soon be at loggerheads.

The CHAIRMAN said the matter had been under the consideration of the board more than once, and he had always set his face against it because he believed that divided authority would lead to conflicts in the direction of the company; but as to the suggestion of an independent audit, it was one which the board would not lose sight of. Mr. Harrison had stated that the average price of coal in Bombay last year was 24½ rupees. That would be for steam coal, but not for gas coal. He also said that coal had been sold in Bombay as low as 33s. per ton. The directors of this company had given instructions to their manager to inspect all cargoes that arrived, and to make purchases at a limit of 16 rupees, which was 32s. The subsequent cost, to get the coal from the ship's side into the works, was about 6s. per ton. Something had been said about contracts. At present the company had none, but it was in contemplation to enter into a contract for coal in the Tyne. It was the best double-screened coal, and a contract had been offered at 6s. 6d. under the spout, or 6s. 9d. in Tyne Dock, so that if freights ruled low, as it was hoped they would do, the coal could be put into the retorts at 40s. per ton. It was the Pelaw Main coal, and had been reported upon by the manager in Bombay as the best coal from this side. As to the other question, he might say they were in no man's hands touching freights, and he would never consent to be so. He had always struggled for a free market and open competition in this respect, and would continue to do so. As to the amount set aside for depreciation, the directors had taken the sum which they believed to be right for the year. With reference to the fittings, a reply had been given to the inquiries at every meeting for the last three or four years, and the circumstances had been fully explained under which so large a stock was sent over. He was prepared to grant that it was indiscreet, but the directors at the time were legislating for unknown contingencies. They expected a much larger demand, and in the result Mr. Hawksley himself had been very much disappointed. How to utilize those fittings was the difficulty with the board, and they would be pleased to receive any suggestion on the subject. Mr. Harrison expressed a doubt as to the value of these fittings, but the directors had had valuations made by an independent gentleman, and had satisfied themselves as to their correctness. With reference to the separation of the meter account from that for mains and services, he did not

know of any reason why it should not be done. Major-General Rigby inquired how the coal contracts were made—whether they were made with a relative of one of the directors. They were not; in fact, there were no contracts at all existing at the present moment, and when there were they would only be for shipments of coal from the Tyne. The board had reserved the right to ship from Liverpool or any other port, from Labuan and from Australia, and just now they were looking with great interest to their supplies from Australia. The Australian coal was a better gas-yielding coal than that obtained on this side, but there was a counterbalance in the deficient product of coke. It had been asked whether the depreciation-fund was a reality, or only had an existence on paper. It was not set aside and invested in Consols; it was invested in the working capital, which produced a much better interest. Then, as to the outstanding debts from customers in Bombay, the gas-rental accounts were sent out monthly, and 1 per cent. per month was charged on accounts in arrear. Looking at the amount of the company's rental, he did not think the arrears were very large. The profit upon fittings sold alone went into the revenue account; the cost price of the fittings was returned to capital. Major-General Rigby complained that the company were not making progress, and gave as a proof that only 10 lights were, at the date of the last advice, in course of being fitted. The company were this year able to pay 4½ per cent. dividend without the extraneous help they received from the sale of coals last year; and, though the number of lights fitting up at the particular time was only 10, that could not be taken as the test of their prosperity. As to the remarks respecting the direction, the Articles of Association provided that the board should receive £800 a year, and he did not think it was too much. The directors were of opinion that six was a sufficient number, and that it ought not to be increased.

Mr. HARRISON desired to hear what Mr. Hawksley had to say respecting the amount set aside for depreciation.

Mr. HAWKSLEY said 1 per cent. was, no doubt, a very fair sum to set aside in this country, not as a fund, but by way of appropriation to capital purposes, in lieu of calling up money. That amount of appropriation was found almost exactly to maintain the works at their original value. But in this particular case there were other considerations—considerations relating to the interests of the shareholders—which had to be borne in mind. What the directors had manifestly done, as would be seen by the form in which the accounts were produced, was to provide the shareholders with a dividend, the largest they thought they could possibly make—viz., a dividend of 4½ per cent. Then they had a residual sum beyond that 4½ per cent., which, without any consideration of whether it amounted to 1 per cent., or ½ per cent., or 2 per cent., was set aside as an addition to the depreciation-fund. And there was no question at all, upon the face of the accounts, as to what was the proper rate, taken *de anno in annum*, to set aside with regard to a capital of £240,000. But what the directors thought was this, that if, at that early period of the history of the company, and under circumstances, no doubt, of some discouragement—viz., that during the past year the increase in the sale of gas had not been so great as anticipated—they could provide the shareholders, out of *bonâ fide* profits, a dividend of 4½ per cent., and still appropriate £1142 by way of provision against depreciation, they were then doing justice to all parties. Now, it was not pretended by the directors—and it did not occur to him in that form—that 1 per cent. would be too small a sum to set aside; but 1 per cent. it was not necessary to set aside in the early years of the undertaking, and while the sale of gas remained so small as it was. Because it must be borne in mind that the outlay of £240,000 was in respect of a provision for supplying 500,000 cubic feet of gas per diem. The quantity which was actually being delivered at that time was one-fourth part, or about 120,000 feet per diem, so that, if 1 per cent. was charged at present upon the £240,000, it would amount virtually to 4 per cent., because the company were only selling one-fourth of the gas which this capital was intended to provide. Under these circumstances it would be impossible, having regard to justice—which the directors must do—to the shareholders, to do so at the present time, but it would have to be done by-and-by. It was not his business, of course, to comment upon the accounts, but as an engineer, having had to do a great deal not only with the construction of gas-works, but with the commercial business of gas companies, he was enabled to say that he did not know of a single instance of 1 per cent. being set aside without robbing the shareholders for the time being of their honestly earned dividends. There was only one other question he thought it necessary to answer, and that was with regard to the undoubtedly large amount which had been invested—under circumstances which at the time appeared to justify it, although it now turned out to be a mistake—in the stock of fittings. Now, he had not personally a great deal to do with that, except so far as procuring the most of the goods, which was done by a very open competition, for the undertaking. The circumstances under which they were obtained were these: At the moment when the works were opened, or rather just before, Bombay was in a state of great commercial exaltation. There was nothing too expensive for the tastes of the people, and, as the directors were informed, there was a perfect mania for the supply of gas. It was anticipated by the directors that the moment the works were opened there would be an immense demand for fittings, and especially for that class of chandelier known to be popular among the richer natives of India. Many of those goods, therefore, were sent out, the larger proportion of them upon application from the manager at Bombay; and not only did the company send out a great many, but, as the directors afterwards discovered, the same feeling was participated by manufacturers here in England, who, without any communication whatever with the company, sent out large stocks on speculation. If manufacturers would do that without communication with the company, it could scarcely be wondered at that the representations from Bombay should have induced the directors to send out a considerable stock also. Just when the works were opened, there came a crisis—a crisis which was much more severe in Bombay than the greatest crisis which had occurred in Europe, and it was owing to the operation of numerous failures and changes which had taken place that the company had got on—not so badly, but so slowly there. And it was owing to this cause that the stock of fittings remained so long on hand. This was also the reason why at present the company were only selling 48 million cubic feet of gas when they might reasonably have expected to be selling 100 million. Good times would no doubt come round again; not, perhaps, such times of exaltation as he had alluded to, and which, indeed, was not desirable. And if the company could now earn, as they had earned, 4½ per cent., and set aside £1142, they would, year by year, and especially with the reductions which had been made in the price of coal, and, in some respects, in the cost of production, be able to earn an increased dividend, and, ere long, arrive at what they were not at present—a very satisfactory amount. He could only add that if the £1042 shown in the accounts was the profit made by the sale of fittings, it amounted, at all events, to 4 per cent. upon the outlay, which was very nearly the same rate as that derived from the sale of gas; so that after all it was not so bad as it might appear to be.

A SHAREHOLDER: Is that from the sale of new fittings or old?

The CHAIRMAN: We are not sending out new fittings except to special order.

Mr. HARRISON said he thought that nothing less than £2000 should be set aside annually for depreciation.

Mr. HAWKSLEY said he had not intended to convey the idea that he thought 1 per cent. would be an improper sum to set aside, but he wished it to be understood that he considered it would be a very impolitic sum to set aside, and a very uncommercial transaction if it were done. Let it be considered what would happen. The company were now selling a quantity of gas which could be produced from works costing not more than £70,000 or £80,000. But the honourable proprietor suggested that the directors should set aside, out of present earnings, 1 per cent. upon £160,000. He (Mr. Hawksley) admitted that this £160,000 represented property that was depreciating; but his point was, what class of shareholders should set the money aside? Why, that class which would sell the gas that £160,000 and not £80,000 would produce. The directors were not to tax the present shareholders and depreciate the value of their present property to give an increased value to the property of future shareholders. If the shareholders were always the same, of course it would be no matter how it was charged, or how soon they began their depreciation; but it would be very improper to reduce the dividends now to 2½ per cent. in order that some one else's dividend, five years hence, should be increased to 10 per cent.

The motion for the adoption of the report was then put, and carried unanimously.

The retiring directors, Mr. H. P. Stephenson and Mr. C. F. Collier, were re-elected, and the latter briefly expressed his acknowledgments.

Mr. H. P. STEPHENSON, in returning thanks, said he felt to a certain extent in a difficulty, because he had been asked for information by several shareholders, and the general feeling of the meeting seemed to be against his giving it. He would not, therefore, enter into the question, but he might just say that, though probably he should be able to point out many things which in his opinion had been injudicious, there were at the same time, he believed, many bright and encouraging things in the company. He wished particularly to say that he had to thank his colleagues for their courtesy to him, and he believed he might conscientiously say that the affairs of the company from the commencement had been managed in the most honest manner, and from a desire on the part of the directors to do all for the best interests of the shareholders. But in saying this he thought it fair to himself to add that he did not think the working of the company at present was satisfactory, and holding the position he did, as chairman of the Singapore Gas Company, it might be convenient for him to give a few figures of comparison, not for the purpose of depreciating the Bombay Company, but with the idea that if he could point out certain bad points in the working of the latter, entirely beyond the control of the directors, the whole of which, however, might be corrected in the future, he believed he should be rendering them a service. The Singapore Company had a rental of only £10,000; the rental of this company was £40,000. At Bombay the company last year were only paid for 7544 feet of gas per ton of coal used; at Singapore the company were paid for 8214 feet. There was no reason whatever why the working of the former, as regards the gas sold, should not be equal to the latter. The leakage was nearly the same, and the comparison of length of mains with rental very similar, as also was the price of gas. He thought, therefore, the Bombay Company might improve upon the gas sold to the extent of 700 feet per ton. With reference to the coke used as fuel, the amount used at Singapore was 28 per cent.; at Bombay it was 52½ per cent. Coke was at a very high price at Bombay, and if the fuel account could be brought down, as he believed it might, it would make something like £3000 or £4000 a year increase in the profits. As to the tar made, it was a small matter, but it might amount to £600 or £700 a year. The Bombay Company only made 6½ gallons to the ton, and were only making 4½ gallons when he joined the board. The subject was pointed out to and pressed upon the manager, and it was found that the measurement of the tar-tanks was wrong. When it was remembered that tar was fetching 7d. to 8d. per gallon, it would be seen that it made a considerable sum in the account. Then the cost of purification in this company was, to his mind, most enormous. At Singapore it was done entirely with oxide of iron; at Bombay a large proportion of lime and a small quantity of oxide were used. At the former place the purification was under ½d. per 1000 feet of gas; at Bombay it cost over 3d. This was a most extraordinary thing, and it could easily be corrected. The subject of the large stock of fittings had been dwelt upon *ad nauseam*, and there was no doubt it ought not to be nearly so large. The amount at which it stood in the accounts was £28,000, and the profit realized by the sale of fittings last year was £1042, or about 4 per cent.; whereas at Singapore the company's stock of fittings stood at £1114, and the profit on sales last year was £681, being at the rate of 48 per cent. Then, as to the retorts, he could appeal to Mr. Hawksley for confirmation of the statement that the deterioration at Bombay had been something enormous—twice or three times as much as it ought to be. He believed that an efficient manager, with a sharp eye upon the workmen, might considerably reduce the labour. About eighteen months ago the company were employing on the works over 200 men; the number now was not more than 70 or 80, and he believed that even this number might be much reduced. From these statements the shareholders would see that there was reason for hope as to the future, in the improvements which it was possible to effect.

The retiring auditors were re-elected, and their remuneration fixed at 25 guineas each.

Mr. DEELEY returned thanks for himself and colleague.

On the motion of Mr. HARRISON, a cordial vote of thanks was given to the chairman and directors.

The CHAIRMAN acknowledged the vote, and said that, so long as the board enjoyed the confidence of the shareholders, they would, as they had hitherto done, devote their best energies to the service of the company.

A vote of thanks was given to the secretary for his past services.

Mr. MARSHALL acknowledged the vote, and said that he had taken a deep interest in the company from the commencement. He was gratified to find that the shareholders approved of his exertions, and he assured them that he would continue to do his best to promote their prosperity.

DR. FRANKLAND'S ANALYSIS OF THE METROPOLITAN WATERS IN JUNE, 1869.—"Royal College of Chemistry, June 26, 1869.—Sir,—I have the honour to submit to you in the following table the results of the chemical examination of the waters supplied to the metropolis during the month of June. For the purpose of comparison I append also the results yielded by the waters supplied to the towns of Edinburgh, Newcastle, Glasgow, Manchester, Preston, Lancaster, Bristol, and Dublin, and by samples of Thames water taken at London Bridge at low and high water; also by the water from the artesian well in Trafalgar Square and the well water from the Royal Mint. With the exception of the Southwark and Grand Junction Companies samples, which were turbid, all the waters were perfectly clear and transparent. The turbid waters contained numerous living organisms. The evidence of previous sewage contamination in the East London Com-

pany's water has been obliterated, most probably either by the action of aquatic plants or by long sojourn in reservoirs.

Companies.	Date and Place of Collection.	Temperature in Centigrade Degrees.	Total Solid Impurity.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Previous Sewage Contamination (Estimated).	Chlorine.	Total Hardness.
Thames.											
Chelsea.....	June 15—Cab Rank, Horse Guards.....	16·7	26·8	·140	·029	·002	·164	·186	1340	1·73	21·52
West Middlesex	June 15—Cab Rank, Portland Road..	17·5	26·8	·196	·034	·000	·169	·203	1370	1·70	21·37
Southwark & Vauxhall..	June 15—Cab Rank, Saint George's Ch.	17·7	26·6	·133	·029	·000	·186	·215	1540	1·68	22·11
Grand Junction.....	June 15—Cab Rank, Woodstock Street.	16·1	28·5	·197	·035	·002	·120	·157	900	1·72	21·81
Lambeth....	June 15—Cab Rank, Lambeth Road..	16·7	27·7	·190	·033	·000	·215	·248	1830	1·72	22·11
Other Sources											
New River...	June 15—Cab Rk., Tottenham Ct. Rd.	16·7	28·1	·091	·017	·000	·126	·143	940	1·46	21·96
Ditto.....	June 15–Park Rd., Haverstock Hill ..		30·0	·119	·022	·000	·165	·187	1330	1·42	15·94
East London.	June 16—Slater's, Old Ford Road .	13·9	25·2	·128	·022	·000	·000	·028	0	1·72	20·04
Kent.....	June16–Deptford Bridge Police Statn.	12·8	41·3	·034	·019	·000	·490	·419	3680	2·46	29·02
Edinburgh Waters.											
Crawley Burn	Sept., 1868.		11·28	·187	·031	·001	·000	·032	0	1·042	6·1
Comiston Wr.			22·58	·085	·017	·001	·744	·762	7124	1·886	10·4
Swanston Wr.			12·70	·378	·059	·001	·000	·060	0	1·390	6·2
Colinton Wr.			14·10	·203	·042	·000	·000	·042	0	0·894	9·2
Newcastle...	September ..		23·40	·237	·062	·000	·000	·062	0	1·586	13·9
Loch Katrine	July, Glasgow		3·00	·161	·011	·001	·000	·012	0	·905	0·3
Manchester..	June.....		6·20	·183	·009	·006	·025	·039	0	1·117	3·7
Preston	August.....		12·44	·236	·031	·006	·000	·036	0	1·590	8·9
Lancaster ...	November...		4·58	·129	·022	·001	·000	·023	0	·993	·87
Bristol	Feb., 1869—Water-Works		28·66	·160	·017	·001	·203	·221	1720	1·3	24·46
Dublin	April, 1869—Water supply		6·34	·238	·024	·001	·000	·025	0	1·24	2·97
Thames water filtered....	April 27, 1869, Lond. Bridge, mid-stream		30·35	·455	·075	·032	·181	·282	1750	1·95	22·7
	at low water		92·85	·540	·122	·025	·394	·537	3830	31·5	23·9
	at high watr										
Artesian well water	May 6, 1869—Trafalgar Sq. London.....		83·4	·150	·012	·070	·000	·070	260	16·55	5·92
Deep Chalk well water.	June 15—Royal Mint.		83·96	·195	·025	·060	·000	·074	170	13·92	17·48
Column 1	2	3	4	5	6	7	8	9	10	11	12

The numbers in columns 4, 5, 6, 7, 8, 9, 10, 11, and 12 all relate to 100,000 parts of the waters. The table is to be read thus: The Chelsea Company's water collected on the 15th of June, at the Horse Guards cab rank, had a temperature of 16·7° Cent.; 100,000 lbs. of it contained 26·8 lbs. of solid impurity; the organic matter, constituting a portion of this impurity, contained ·140 lb. of carbon and ·020 lb. of nitrogen. This solid impurity also contained ·164 lb. of nitrogen in the form of nitrates and nitrites, besides ·002 lb. of ammonia, whilst the total amount of *combined* nitrogen in every form was ·186 lb. The above quantity of water supplied by the Chelsea Company had been, after its descent to the earth as rain, contaminated with sewage or manure matter equivalent to 1340 lbs. of average filtered London sewage. By gradual oxidation, partly in the pores of the soil, partly in the Thames and its tributaries, and partly in the reservoirs, filters, and conduits of the company, this sewage contamination had been converted into innocuous inorganic compounds before its delivery to consumers. The above quantity of water also contained 1·73 lb. of chlorine. Finally, 100,000 lbs. of the Chelsea Company's water contained 21·52 lbs. of carbonate of lime, or an equivalent quantity of other soap-destroying ingredients.—I have, &c., E. FRANKLAND.—The Registrar-General, &c."

DR. WHITMORE'S REPORT ON THE QUALITY OF THE WATER SUPPLIED IN ST. MARYLEBONE, IN JUNE, 1869:—

June.	Total Solid Matter in degrees or grains per Imperial gallon.		* Loss by Incineration of Solid Matter in previous column.		Ammonia.
	June, 1868.	June, 1869.	June, 1868.	June, 1869.	
	0°	0°	0°	0°	0°
Distilled Water . . .					
West Middlesex water	17·44	17·16	0·58	0·56	—
Grand Junction water	17·04	18·36	0·62	0·60	—

* The loss by incineration represents the amount of organic and other volatile matters contained in an Imperial gallon (70,000 grains) of water.

AVERAGE COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS IN JUNE, 1869.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen.		Hardness.	
			As Nitrates, &c.	As Ammonia.	Before Boiling.	After Boiling.
Thames Water Comps.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction. . . .	19·33	0·077	0·090	0·000	14·5	3·7
West Middlesex . . .	17·83	0·065	0·096	0·003	14·1	4·1
Southwark and Vauxhall.	17·93	0·077	0·038	0·001	14·2	3·3
Chelsea	18·10	0·082	0·128	0·000	14·0	3·3
Lambeth	17·47	0·059	0·128	0·001	14·0	3·9
Other Companies.						
Kent	27·33	0·006	0·190	0·000	19·8	6·1
New River	16·33	0·035	0·102	0·001	14·0	3·3
East London.	18·87	0·053	0·120	0·000	14·6	4·2

Note.—The amount of oxygen required to oxidize the organic matter, nitrites' &c., is determined by a standard solution of permanganate of potash acting for three hours; and, in the case of the metropolitan waters, the quantity of organic matter is about eight times the amount of oxygen required by it.

The average quantity of water supplied daily to the metropolis in the month of May last was, according to the returns of the water companies to the Medical Officers of Health, 92,830,840 gallons; and the number of houses supplied was 464,001. This is at the rate of 31·5 gallons per head of the population daily.

H. LETHEBY, M.B.

DR. STEVENSON'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF JUNE, 1869:—

Date.	Number of Observations.	Average Light in Candles produced by 5 Ft. of Gas per Hour.	Light in Candles reduced to Consumption of 120 Grs. per Hour.	Traces of Ammonia.	Traces of Sulphuretted Hydrogen.
June 1	10	13·7	13·9	Present.	None.
3	10	13·6	14·2	,,	,,
5	10	15·3	15·2	,,	,,
8	10	13·1	13·8	,,	,,
10	10	13·0	14·1	,,	,,
12	10	14·0	14·1	,,	,,
15	10	13·8	13·5	,,	,,
19	10	13·4	13·6	,,	,,
22	10	13·4	13·6	,,	,,
24	10	13·3	13·3	,,	,,
26	10	14·2	13·9	,,	,,

The maximum illuminating power was 15·2, the minimum 13·3, the mean 13·9 standard sperm candles. The mean illuminating power was 2·9, and the minimum 1·3 candles in excess of the legal requirements. Ammonia was invariably present; sulphuretted hydrogen invariably absent. Sulphur was present, on an average, to the extent of 19·49 grains per 100 cubic feet; an amount just below that allowed by the Statute.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE GAS SUPPLIED IN ST. MARYLEBONE, IN JUNE, 1869:—

June.	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quantity of Sulphur in 100 Cub. Ft.	Mean Quantity of Ammonia in 100 Cub. Ft.	Sulphuretted Hydrogen.
	* Mean of 25 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Imperial Company's gas . .	15·68	16·51	14·63	26·68	10·61	31·37	4·67	None.
Chartered Company's common gas	14·94	16·52	13·88	34·10	13·83	30·84	7·97	None.
Chartered Company's cannel gas	21·48	22·84	20·26	28·71	13·48	23·61	7·07	None.

Mean of daily readings of Barometer, 29·85
,, ,, ,, Thermometer, 64·83

* Each observation consists of 10 readings of the photometer, at intervals of one minute.

The illuminating power of the Imperial Company's gas was very high during the month, the mean being upwards of 15½ candles; eight times it exceeded 16 candles, and twice only did it fall below 15 candles. The mean quantity of sulphur contained in it was exceedingly large. The Act of Parliament which is still applicable to this gas, but which is nearly defunct, certifies that not more than 20 grains of sulphur shall be allowed in 100 cubic feet of gas; the results of continuous experiments during the past month show an amount never less than 25·65 grains, and on one experiment as much as 36·61 grains. The mean quantity of ammonia, on the other hand, was unusually small. The mean light of the Chartered Company's common gas was very nearly a candle in excess of what is required by the City Gas Act; twice only it fell below the legal standard, but on six occasions it exceeded 15 candles, and on two it was over 16 candles. This gas also contained sulphur largely in excess; at present, however, no penalties can be enforced, be the quantity what it may. The quantity of ammonia in 100 cubic feet of gas was very nearly 8 grains, or 3 grains more than what is allowed by the Act. The mean illuminating power of the cannel gas of the Chartered Company was equal to 21½ candles, and on no occasion did it fall below the legal standard; the quantity of sulphur impurity contained in this gas was considerably less than what was found in the other two gases, although still rather large. The ammonia was also in excess. Daily testings failed to discover any traces of sulphuretted hydrogen in either of the gases. The above results were obtained from the Imperial Company's gas, manufactured at their Fulham works, and from the common and cannel gas of the Chartered Company, manufactured at their works in Horseferry Road, Westminster.

SHEFFIELD.—At the last meeting of the Sheffield Town Council it was resolved—"That the nominee directors be requested to report as to the management, especially financial, of the Sheffield United Gas Company, and as to the advantages, if any, likely to arise to the public by such company being purchased by and placed under the control of the Town Council."

WIMBLEDON SEWERAGE.—The local board have had a system of drainage laid out by their surveyor, Mr. Bird, to convey the sewage of New Wimbledon in the valley of the Wandle, and from the village of Wimbledon to the lowest part of the Common, where they propose to irrigate the land by the sewage, and Mr. Grantham has been called in to report upon the proposed scheme.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1996.—SAM SMITHSON, of Heckmondwike, in the co. of York, dyer, and GEORGE SENIOR and JOHN INMAN, of Brighouse, in the same co., brass-finishers, for "*Improvements in valves or valve-taps for regulating the discharge or flow of water or other fluids or gases.*" (Complete specification.) July 2, 1869.

2006.—HENRY EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in meters for measuring liquids.*" A communication. July 2, 1869.

2016.—JOHN HART, of Leamington, in the co. of Warwick, for "*Improvements in the means of and apparatus for separating, distributing, and utilizing sewage.*" July 3, 1869.

2021.—WILLIAM DUCKWORTH the younger, of Liverpool, in the co. of Lancaster, architect, for "*Improvements in taps for general purposes.*" July 5, 1869.

2024.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, London, consulting engineer, for "*Improvements in water-meters.*" A communication. (Complete specification.) July 5, 1869.

2032.—WILLIAM WALKER, of Dundee, in the kingdom of Scotland, N.B., for "*Improvements in motive-power engines, rotary pumps, and fans.*" July 6, 1869.

2036.—LEONARD CLAYTON, LAWRENCE CLAYTON, and JAMES SMITH, of Hunslet, near Leeds, in the co. of York, gas engineers and contractors, for "*Improvements in the construction of taps or valves.*" July 6, 1869.

2038.—WILLIAM QUARTERMAINE EAST, of the Drummond Hotel, Drummond Street, Euston Square, in the co. of Middlesex, for "*Improvements in the means of and apparatus for indicating or registering the flow of liquids or fluids from vats, casks, or other receptacles.*" July 6, 1869.

2052.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*Improvements in the construction of chandeliers.*" A communication. July 7, 1869.

2067.—JOHN HENRY JONES, of Field Terrace, New Wandsworth, engineer, for "*Improvements in lamps.*" July 9, 1869.

2070.—GEORGE AUGUSTUS NOWELL, of Nuneaton, in the co. of Warwick, for "*Improvements in lamps.*" July 9, 1869.

2081.—JOSEPH BEARD, of Droylsden, in the co. of Lancaster, brassfounder, for "*Improvements in pumps.*" July 10, 1869.

2103.—CLEAVELAND FORBES DUNDERDALE, of New York city, in the state of New York, U.S.A., for "*An improved apparatus for generating hydrogen gas, and for carburetting hydrogen gas or atmospheric air for illuminating and other purposes.*" (Complete specification.) July 12, 1869.

GRANTS OF PROVISIONAL PROTECTION.

1557.—ZEBULON ERASTUS COFFIN, of Newton Centre, in the state of Massachusetts, U.S.A., for "*Improvements in stop-cocks or valves.*" May 20, 1869.

1925.—ROBERT NOKES WILLIAMS, of 84, Hackney Road, in the co. of Middlesex, mahogany and veneer merchant, for "*Improvements in the manufacture of reflectors for artificial light.*" June 24, 1869.

1931.—ALFRED HENRY STILL and DENNY LANE, both of the city of Cork, for "*Improvements in the manufacture of gas.*" June 24, 1869.

1979.—RICHARD WAINWRIGHT WHITEHEAD, of Ashton-on-Mersey, in the co. of Chester, for "*Improvements in coupling or jointing pipes or tubes.*" July 1, 1869.

2006.—HENRY EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in meters for measuring liquids.*" A communication. July 2, 1869.

2016.—JOHN HART, of Leamington, in the co. of Warwick, for "*Improvements in the means of and apparatus for separating, distributing, and utilizing sewage.*" July 3, 1869.

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INVENTIONS PROTECTED FOR SIX MONTHS ON THE DEPOSIT OF A COMPLETE SPECIFICATION.

1996.—SAM SMITHSON, of Heckmondwike, in the co. of York, dyer, and GEORGE SENIOR and JOHN INMAN, of Brighouse, in the same co., brass-finishers, for "*Improvements in valves or valve-taps for regulating the discharge or flow of water or other fluids or gases.*" July 2, 1869.

2024.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, London, consulting engineer, for "*Improvements in water-meters.*" A communication." July 5, 1869.

2103.—CLEAVELAND FORBES DUNDERDALE, of New York city, in the state of New York, U.S.A., for "*An improved apparatus for generating hydrogen gas, and for carburetting hydrogen gas or atmospheric air for illuminating and other purposes.*" July 12, 1869.

NOTICES TO PROCEED.

560.—JOSEPH JOHNSON and WILLIAM GILL, both of Unstone, in the co. of Derby, joiners, for "*Improvements in rotary engines and pumps.*" Feb. 23, 1869.

571.—WILLIAM WILLIAMS, of 4, Mitford Street, Liverpool, in the co. of Lancaster, for "*Improvements in laying and joining pipes for gas, water, and other like purposes.*" Feb. 24, 1869.

661.—JOHN BERGER SPENCE, of Manchester, in the co. of Lancaster, merchant, for "*Improvements in substances used for the purification of illuminating gas, and in the recovery of a waste product arising therefrom.*" March 4, 1869.

711.—JAMES JOHN SHEDLOCK, of King's Road, Camden Town, in the co. of Middlesex, engineer, for "*Improvements in wet gas-meters.*" March 9, 1869.

712.—JAMES JOHN SHEDLOCK, of King's Road, Camden Town, in the co. of Middlesex, engineer, for "*Improvements in dry gas-meters.*" March 9, 1869.

1054.—JOHN ROBBINS, of Tipton, in the co. of Stafford, moulder, and JAMES ALLBUT, of Tipton, aforesaid, iron boat builder, for "*Improvements in pumps for raising and forcing liquids.*" April 7, 1869.

1142.—BALDWIN LATHAM, of 6, Westminster Chambers, Westminster, in the co. of Middlesex, civil engineer, for "*Improvements in ventilators for sewers, also applicable for deodorizing noxious gases arising in the processes of certain manufactures.*" May 11, 1869.

1522.—JOHN WOODWARD, of Queen's Foundry, New Islington, Ancoats, in the city of Manchester, in the co. of Lancaster, engineer, for "*Improvements in gas and water meters.*" May 18, 1869.

2024.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, London, consulting engineer, for "*Improvements in water-meters.*" A communication. July 5, 1869.

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle and Middlesboro'.	Wales.	Yorkshire, Derbyshire, and Staffordshire
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1 (g.m.b.)	3 15 0	2 10 0	3 4 0	3 10 0	3 10 0
1¼ and 2-inch Socket-pipes	7 0 0	5 15 0	5 10 0	6 0 0	7 0 0
2½ and 3-inch ditto	6 10 0	5 5 0	5 0 0	5 15 0	6 10 0
4 and 5-inch ditto	6 0 0	4 15 0	4 10 0	5 5 0	6 0 0
6 inches and upwards ditto	5 15 0	4 5 0	4 0 0	5 0 0	5 15 0
Retorts, 1st fusion, hot blast	5 10 0	4 10 0	4 5 0	5 0 0	5 10 0
Ditto, 2nd ditto, cold ditto	6 10 0	—	—	—	6 10 0
Tank-plates, ¼ thick and above	6 0 0	5 0 0	4 15 0	5 10 0	6 0 0

WROUGHT-IRON TUBING,

Subject to 50 per cent. Discount.

	¾ in.	1¼ in.	1½ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 14 feet—per foot	1 8	1 1	0 10	0 7	0 5	0 4½
Ditto ditto, from 12 in. to 23½ in.—each	3 0	2 0	1 6	1 1	0 9	0 8
Long Screws, from 12 in. upwards	4 0	2 3	2 0	1 6	1 2	0 11
Bends and Springs	4 3	2 3	1 9	1 3	0 11	0 8
Square Elbows, equal or reducing; Round Elbows, 5 per cent. extra	3 9	2 3	1 9	1 3	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 9
Crosses, ditto, equal or reducing	4 9	3 6	3 0	2 3	1 9	1 6
Iron Cocks	20 9	13 0	10 0	7 3	5 0	3 8
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4½
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

	s. d.
Haswells, Nettleworth Primrose, and South Pelaw	6 6
Felling, Framwell Gate, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Burnhope, Craghead, Charlaw, Derwent, East Castle, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Lanchester Pelaw, Medomsley Mickley, New Pelaw, Pelaw Main, Ravensworth, Seaham, South Moor Pelton, South Leverson, Townley Main, Tyne Main, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Brancepeth, Dean's Primrose, Londonderry Gas, New Pelton, Pelton, South Pearath, Stella, Urpeth, Washington Hutton, and West Leverson	7 6
Ramsay's Newcastle Cannel	15 0
Wigan Cannel (at Liverpool)	17 0
Scotch Cannel:—	
Boghead—at Bo'ness, 38s.; at Leith	38 8
Muirkirk	27 0
Kirkness, best (at Burntisland)	28 6
Capeldrae, 1st quality (at ditto)	28 6
Ditto, 2nd ditto (at ditto)	18 6
Cowdenbeath	12 0
Lesmahago (at Glasgow)	31 6
Ditto (at Granton)	32 6
Arniston	27 6
Wemyss, f.o.b.	22 6
Haywood, Wilsontown (at Granton)	23 0
Pirnie, or Methill	17 0
Lothian's Cannel (f.o.b. at Leith)	26 0
Bo'ness Cannel (at Bo'ness)	19 0
Myles' Cannel	23 6
Lochore Parrot (at Burntisland)	28 0
Lanemark (at Glasgow)	16 0
Elphinstone Tower (at Leith)	20 0
Coppa Cannel (on railsat Birkenhd.)	14 9
Ditto ditto (ditto at Connah's Quay)	14 3

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

	£ s. d.
Chatham and Rochester	5 0
Cork	7 6
Dover, Folkestone, and Ramsgate	5 9
Dublin	8 6
Exeter Quay	8 0
Ipswich	4 6
London (from Leith)	3 0
London (Pool)	5s. 1½d. to 5 3
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	6s. 3d. to 6 9
Plymouth	7 3
Shoreham	6 0
Whitstable	5 3
Weymouth	7 0
Foreign.—Per Keel:—	£ s.
Barcelona	19 0
Bordeaux	11 10
Boulogne and Calais	£6 5s. to 6 10
Cadiz	12 5
Cronstadt	—
Copenhagen	£8 15s. to 9 0
Genoa	18 10
Hamburg	7 5
Havre de Grace	7 17 6
Leghorn	18 15
Lisbon	11 0
Rotterdam	6 17 6
Stettin	9 10
Trieste	19 0
Venice	22 0

SUNDRIES.

	£ s. d.
Best Newcastle Fire-bricks, per 1000	£2 10s. to 2 15 0
Cliff's Fire bricks (at Wortley), per 1000	2 15 6
Ingham's do. (at Wortley), p. 1000	2 15 0
Farnley Iron Co.'s Fire-bricks (at Wortley), less discount	2 17 0
Fire-clay Retorts, p. ft. run	5s. 6d. to 0 7 6
Tough Cake Copper, per ton	74 0 0
English Pig Lead, per ton	19 0 0
Welsh Bar Iron (in London), p. ton	6 15 0
Foreign Spelter, per ton	20 17 6
English Block Tin, per ton	123 0 0
Banca, per ton	135 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

Share List of Metropolitan Gas Companies.

Number of Shares issued.	Amount per Share.	Name of Company.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Price per Share.
	£		£ s. d.	£ s. d.	£
8000	10	Anglo-Romano	10 0 0	10 0 0	11 — 12
5000	20	Bahia (Limited)	20 0 0	3 0 0	13 — 14
1008	20	Do., preference	20 0 0	10 0 0	24 — 25
750	20	Do., do., redeemable	20 0 0	10 0 0	20 — 22
40000	5	Bombay (Limited)	5 0 0	4 0 0	4¼ — 4½
10000	5	Do., third issue	4 0 0	4 0 0	3¼ — 3½
10000	20	British (Limited) (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge, & Holywell.)	20 0 0	10 0 0	30 — 31
12000	50	*Chartered*	50 0 0	4 5 0	46 — 46½
6060	50	Do.	45 0 0	4 5 0	41 — 41½
10000	20	*City of London*, A shares	20 0 0	8 0 0	23 — 24
10000	10	Do., B shares	10 0 0	4 0 0	6¾ — 7
9629	10	Do., new shares	10 0 0	8 0 0	11 — 12
17490	25	*Commercial*	25 0 0	10 0 0	35 — 36
20000	20	Continental Union	20 0 0	5 0 0	22 — 23
5213	20	Do., preference	20 0 0	7 0 0	20 — 20½
5000	10	*Crystal Palace District*	10 0 0	10 0 0	13½ — 14
5000	10	Do., preference	10 0 0	6 0 0	12½ — 13
10000	10	Do., new shares	10 0 0	7 0 0	10½ — 11
4000	50	*Equitable*	50 0 0	10 0 0	64½ — 65½
4000	25	Do., new shares	25 0 0	10 0 0	32½ — 33
23406	10	European (Limited)	10 0 0	11 0 0	15 — 15½
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	11 0 0	7½ — 7¾
20000	10	*Great Central Gas Consumers*	10 0 0	.. ..	11 — 11½
5000	10	Hong Kong (Limited)	10 0 0	6 0 0	8 — 10
26000	50	*Imperial*	50 0 0	10 0 0	68 — 68½
26000	10	Do., new shares	4 0 0	10 0 0	6¾ — 7
26000	12½	Do., new shares	3 0 0	7 0 0	3½ — 3¾
1300	100	Do., bonds	£100	10 0 0	175 —180
28000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwerp, Bordeaux, Brussels, Cologne, Frankfort-on-Maine, Haarlem, Stolberg, Toulouse, & Vienna.)	43 15 0	16 0 0	110 —112

Number of Shares issued.	Amount per Share.	Name of Company.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Price per Share.
	£		£ s. d.	£ s. d.	£
400	100	Imperial Mexican (Limited)	100 0 0	nil.	
200	100	Do., new	100 0 0	nil.	
3000	40	*Independent*	40 0 0	10 0 0	51 — 53
3000	10	Do.	10 0 0	5 0 0	7 — 8
3000	20	Do.	15 0 0	7 10 0	15 — 16
7133	50	*London*	50 0 0	10 0 0	66 — 68
5610	25	Do., 1st preference	25 0 0	6 0 0	26 — 28
503	50	Do., 2nd preference	50 0 0	6 0 0	
214	50	Do., 3rd preference	50 0 0	6 0 0	
£18781		Do., 1st preference stock		6 0 0	
£11828		Do., 2nd preference stock		5 0 0	
		Nictheroy, Brazil (Limited)			
15000	5	Malta and Mediterranean (Limited)	5 0 0	3 10 0	3½ — 4
6000	5	Do., preference	5 0 0	7 0 0	4¾ — 5¼
30000	5	Oriental (Calcutta)	5 0 0	10 0 0	7½ — 8
30000	5	Do., new shares	1 0 0	10 0 0	1¾ — 1¾
10000	5	Ottoman (Limited)	5 0 0	nil.	1½ — 2¼
12500	10	Pará (Limited)	10 0 0	7 10 0	8¼ — 9
27000	20	*Phœnix*	20 0 0	10 0 0	26½ — 27
3600	100	Do., new	35 0 0	7 10 0	36 — 36½
144000	Sk.	Do.	100 0 0	5 0 0	73¼ — 74½
5000	20	*Ratcliff*	20 0 0	10 0 0	23 — 24
	20	Rio de Janeiro (Limited)	20 0 0	10 0 0	24 — 25
6959	5	Singapore (Limited)	5 0 0	4 0 0	
2000	5	Do., preference	5 0 0	7 10 0	
		Shanghai			
4800	50	*South Metropolitan*	50 0 0	10 0 0	73 — 75
4800	12½	Do., new shares	12 10 0	10 0 0	18¾ — 19
15000	10	*Surrey Consumers*	10 0 0	10 0 0	13¼ — 13½
10000	10	Do., new	6 0 0	10 0 0	8 — 8½
9000	4	United General (Limerick)	4 0 0	5 0 0	2 — 2¼
10000	10	*Victoria Docks*	5 0 0	6 0 0	
1500	10	*Wandsworth and Putney*	10 0 0	10 0 0	10 — 12
1500	10	Do.	10 0 0	7 10 0	
1819	10	Do.	10 0 0	7 10 0	
1138	10	Do.	5 0 0	7 10 0	
20000	10	Western (Limited) A shares	10 0 0	10 0 0	15 — 15½
10000	10	Do., B shares	7 0 0	10 0 0	9¼ — 10
10000	10	Do., C shares	7 0 0	10 0 0	9½ — 10
20000	10	Do., D shares	1 0 0	10 0 0	1¾ — 2
8000	5	*West Ham*	7 0 0	7 10 0	7¼ — 7¼
6000	5	Do., new shares	7 0 0	7 10 0	
551	10	West London Junction (Limited)	10 0 0	6 0 0	
520	10	Do., preference	10 0 0	6 0 0	

Advertisements.

WANTED, for a small country gas-work, a MAN to Manufacture the Gas only. Wages 18s. per week in winter, and 14s. in summer, with coal and gas. He will be at liberty to do other work in addition to making the small quantity of gas required in the summer.

Apply to PORTER AND CO., 7, John Street, Adelphi, LONDON, and Gowts Bridge Works, LINCOLN.

TO FOREIGN GAS COMPANIES, &c.

WANTED, a situation as Fitter and BRASS FINISHER. Has had experience in repairing meters, well seasoned to a warm climate, first-rate testimonials and references.

Address GAS-FITTER, 2, Charlwood Place, Pimlico, LONDON.

WANTED, for the Croydon Commercial Gas and Coke Company, a general WORKING FOREMAN under the Manager. He must possess a practical knowledge of the manufacture of gas, and of main and service laying and meter fixing, &c., as he will be required occasionally to take charge of the works in the absence of the Manager.

Applications, enclosing testimonials from last employer, and stating age and amount of salary expected, with amount of security proposed to be given, to be sent to the Secretary, Mr. W. PURVIS, 23, George Street, Croydon.

Croydon, July 16, 1869.

DUNGANNON GAS COMPANY.

WANTED, a Manager for these works. Salary £100 per annum, with a free house, coal, and light. None but competent men need apply, whose character will bear the strictest investigation, particularly as to ability, sobriety, and integrity.

Applications, enclosing copies of testimonials, to be addressed to the SECRETARY, Dungannon Gas Company, Dungannon, county TYRONE.

Board-Room, Dungannon, June 14, 1869.

FOREMAN wanted, in Artificial Manure Works. Must be used to machinery, and able to drive an engine; also capable of superintending and directing workmen. Must have first-class testimonials.

Apply by letter to W., 10, Grove Street, LEAMINGTON.

WATER-WORKS FOREMAN.

THE Cambridge University and Town Water-Works Company are in want of a FOREMAN for their works. He must have a thorough practical knowledge of water-work matters, such as meters, plumbing, &c. Although not absolutely necessary, a man acquainted with engine-fitting would be preferred.

Applications (endorsed "Foreman"), stating age, salary required, &c., to be addressed to me at my Office, 4, Bene't Street, Cambridge, on or before Wednesday, the 28th inst. HENRY TOMLISON, Manager.

Cambridge, July 15, 1869.

FOR SALE, 4 Shares in the Gas-Meter Company.

Apply to ZELATA, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS COMPANIES AND GAS-FITTERS.

WANTED, by a respectable young Man, a situation as Manager of a Gas-Work, Meter Inspector, or Gas-Fitter. Good reference given.

Apply to JOHN BUNN, North Load Street, GLASTONBURY.

THE Directors of the Gravesend and Milton Gaslight Company are about to appoint a SUPERINTENDENT of their works at Gravesend. He will be required to have a thorough practical knowledge of gas machinery and works, and the manufacture of gas, and also to have had experience in the actual working of gas-works.

Particulars of the duties of the office can be seen at our Offices, 4, Edwin Street, Gravesend. The salary will be £200 per year, with house at the works, coals, and gas.

Letters from candidates, enclosing testimonials as to character and ability (which will be returned on application), are to be sent to us, endorsed "Superintendent, Gas Company," on or before the 27th day of July inst., after which date an appointment will be made with candidates whose attendance is required.

SOUTHGATE AND SON, Secretaries.

Gravesend, July 12, 1869.

TO GAS COMPANIES & OTHERS.

THE Secretary and Manager to a provincial gas company, where the number of consumers is upwards of 3000, will be disengaged at the end of August, and would be glad to offer his services to a gas company, where the annual make of gas is from 30 to 50 million cubic feet. Thoroughly and practically understands the manufacture and distribution of gas upon the best principles, also the varied routine of office work, having had upwards of 10 years experience in the general management of gas-works, and who has during the last 7 years held the position of secretary and manager.

The most satisfactory references and testimonials can be furnished as to ability and public and private character, and security given to the required amount. Aged 31, married.

Address GAS MANAGER, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

PURIFIERS FOR SALE.

A Set of Four Cast-Iron Purifiers, 8 ft. square, with wrought-iron lids, wrought-iron centre-valve in cast-iron case, wood sieves, connecting-pipes, and lifting apparatus complete, and nearly new.

If preferred, Cockey's patent centre-valve, or cast-iron sieves, in place of above.

For particulars, apply to G. PORTER, Manager, Gas and Water-Works, CARLISLE.

PETERBOROUGH GAS COMPANY.

SURPLUS Plant for Sale.—Four 6-ft. square cast-iron Purifiers; Four 7-ft. square wrought-iron Purifiers; wrought-iron Sieves and Covers, and Lifting Apparatus complete; and 7-in. and 8-in. Connexions, with centre-valve. Also Four lengths 16-in. round Hydraulic Main, 11 H-Pipes, Six 18-in. Mouthpieces, Lids, and Screws; also several Valves.

For further particulars, apply to E. EVANS, Manager, at the Office, LONG CAUSEWAY.

June 16, 1869.

WANTED, a steady Man as Stoker. Wages 21s. per week. Paid for extra time.

Apply to MANAGER, Gas-Works, SLEAFORD.

GAS-WORKS FOR SALE.

THE Liquidators of the County and General Gas Consumers Company, Limited, are prepared to receive OFFERS for the NORTHFLEET GAS-WORKS. The works consist of retort-houses, with 22 retorts, coal-store, foreman's and meter house, and store-sheds, together with retort-fittings, condenser, scrubber, two 8-ft. purifiers, meter, governor, and brick gasholder-tank and holder, 40 ft. diameter and 16 ft. deep. The gas and meter rental amounts to about £800 per annum, exclusive of a large consumer lately laid on.

Further particulars to be obtained of the Liquidators, Mr. H. P. STEPHENSON, 15, Abingdon Street, WESTMINSTER; or Mr. W. J. WHITE, 33, King Street, CHEAPSIDE.

TO IRONFOUNDERS.

THE Oldham Corporation Gas Com-mittee is prepared to receive TENDERS for supplying Eight Wrought-Iron HYDRAULIC MAINS, each 2 ft. diameter and 42 ft. 1 in. long.

Plans and specification may be seen at the Gas Offices, OLDHAM.

Endorsed tenders to be sent in on or before Tuesday, the 27th inst.

The lowest or any tender not necessarily accepted.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

The EIGHTH ANNUAL GENERAL MEETING of this Association will be held in the Hall of the Andersonian University, George Street, Glasgow, on WEDNESDAY, the 28th of July current, at Eleven o'clock a.m.—Mr. G. R. HISLOP, Engineer, Gas-Works, Paisley, President of the Association, will occupy the chair.

PROCEEDINGS.

I.—BUSINESS MEETING.

Election of Office-Bearers for ensuing year; admission of New Members, &c.

II.—PAPERS AND COMMUNICATIONS.

President's Address.

Report by Committee appointed at last Annual Meeting, "On the Use of Glycerine as a Substitute for Water in Consumers Meters."

"On an Improvement of the Working of the Gas Governor," illustrated with Drawings. By Mr. Thomas Whimster, Gas-Works, Perth.

"On a New Method of Setting and Heating the Experimental Retort, and its Adaptation for other Purposes." By Mr. James Hislop, Gas-Works, Ayr.

Lecture on "Some Points in the Chemistry of Coal Gas." By William Wallace, Ph.D., F.R.S.E.

At the close of the proceedings the Members and friends will dine together in Carrick's Hotel, George Square. Tickets may be had from the Secretary.

Through the kindness of the Proprietors and Managers of several extensive works in connexion with the profession in and near Glasgow, the Committee has been enabled to make arrangements whereby the Members may have an opportunity of inspecting these on Thursday, July 29; and they trust that as many of the Members as can do so will take advantage of this.

WM. MACKENZIE, Hon. Sec.

Gas-Works, Dunfermline, July 14, 1869.

IN CONSEQUENCE OF THE ENLARGEMENT OF THE WORKS,

THE Directors of the High Wycombe Gas Company have FOR SALE a set of Three cast-iron dry-lime Purifiers, 6 ft. by 5 ft. 9 in. by 2 ft. 10 in., with 6-in. connexions, &c.; 6-in. Governor, with connexions; Two Gasholders, each capable of containing 8400 cubic feet of gas; 12-in. Hydraulic Main and Ascension-Pipes; cast-iron Frames, Mouthpieces, &c., for Cliff's Ovens; and a small Scrubber.

For further particulars apply to Mr. W. A. PADFIELD, Manager and Secretary, Gas-Works, HIGH WYCOMBE.

"FIVE MINUTES' TALK ABOUT GAS"

Is intended to be given by Gas Companies to their Customers. It is hoped the advice it contains may be the means of correcting mistakes and preventing accidents; and also of assisting the Officers in some of the most difficult of their duties.

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O'NEILL'S NATURAL HYDRATED PEROXIDE OF IRON is acknowledged to be the best in the market. It contains 90 per cent. of pure Oxide, is light, permeable, and perfectly free from grit and other deleterious ingredients. Now used exclusively in several of the largest London and provincial gas-works.

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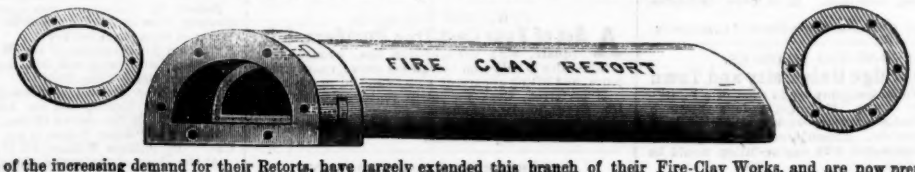

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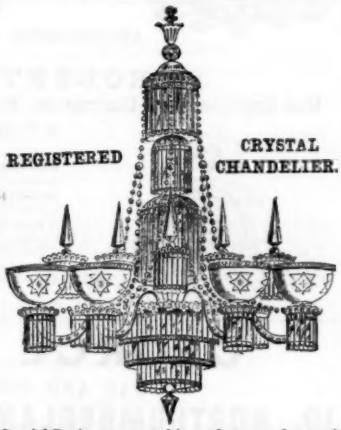

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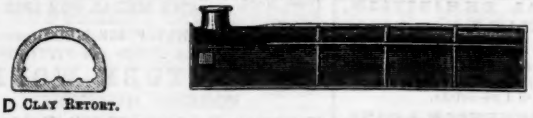

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RETORT SETTINGS, heated by tar without the production of smoke.
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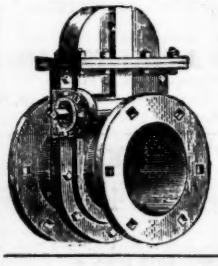
WITH WROUGHT-IRON PINIONS,
From 2 inches to 18 inches, price 9s. 6d. to 12s. per inch diameter.



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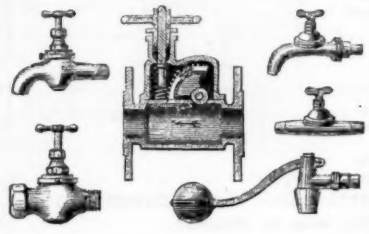

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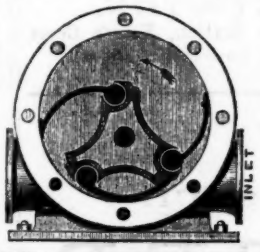

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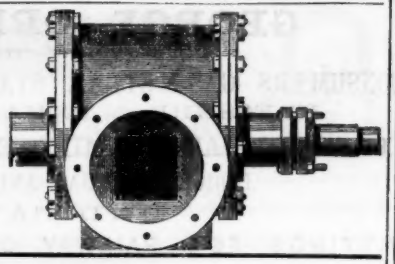

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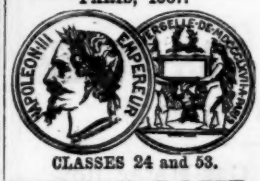

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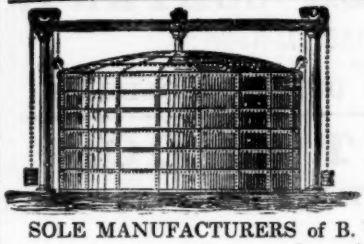

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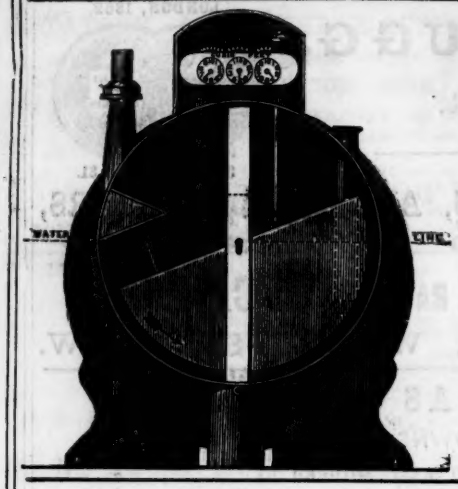

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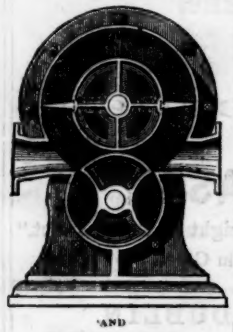

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